Acuity® LT Wireless System

Installation Guide

Software Version 6.X compatible with:

- Propaq CS Software Versions 3.42.01 or higher
- Propaq LTR Software Versions 1.X or higher
- Micropaq Software Versions 1.3X or higher

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Advancing Frontline Care™

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Reorder Part Number 810-1603-XX
Manual Part Number 810-1601-02 Rev B, 04/2007

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Printed in USA

CE 0297

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1 Introduction

About this Manual

This *Acuity LT Wireless Installation Guide* provides information needed to plan and perform the installation of your Acuity LT Wireless System. This information describes how to:

- Plan the installation
- Install the wiring
- Install the system
- Troubleshoot the system

In order to make sure your equipment is installed properly, be sure to read and follow all of the planning and installation steps provided in this manual.

For information about how to operate the Acuity LT Wireless System, refer to the *Acuity LT Wireless System Directions For Use* (810-1600-XX).

Symbols Used in this Manual

WARNING Warning statements identify conditions or practices that could result in personal injury.

Caution Caution statements identify conditions or practices that could result in damage to the equipment or property.

Note Notes provide additional important information.

Safety and Compliance Information

CE 0297 The CE Mark and Notified Body Registration Number signify the Acuity System meets all essential requirements of European Medical Device Directive 93/42/EEC.

Table 1. Acuity Compliance with Safety Standards

Acuity Component(s)	Product Category	Organization and Standard
Propaq CS, Propaq LTR, Micropaq monitors	Medical Equipment	EN 60 601-1:1990 A1:1992, A2:1995
All components operating together as a system	Electromagnetic compatibility for Medical Equipment	EN 60601-1-2:2001
All components operating together as a system	Medical Systems	EN 60601-1-1:2001

WARNING The Acuity LT Wireless System must be installed by technical personnel qualified by training and experience in compliance with the safety standards listed above, in compliance with local and state regulations, and according to the instructions provided in this *Acuity LT Wireless Installation Guide*. Improper installation could result in improper operation of the Acuity LT Wireless System, prevent patient monitoring at the Central Station, and cause equipment damage or failure.

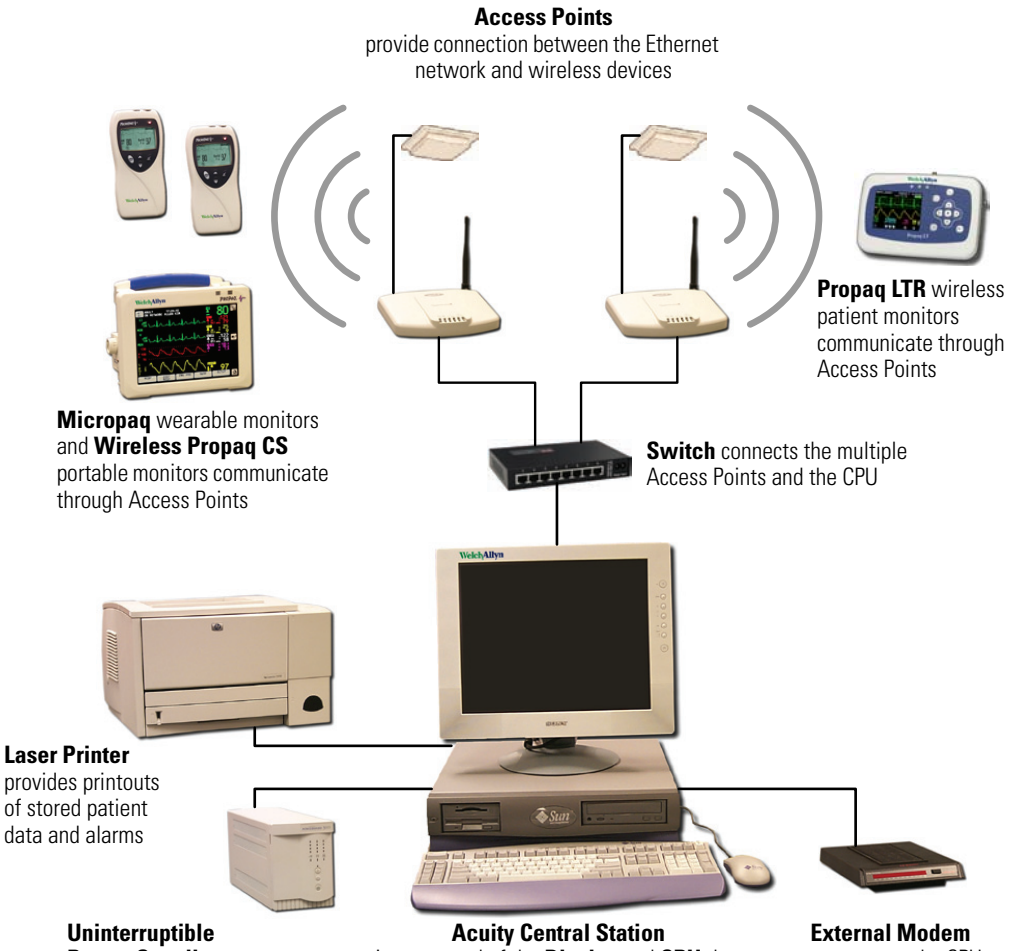
WARNING After making any changes to Acuity LT system hardware or software, make sure that system performance is validated by qualified personnel according to instructions in the *Acuity LT Installation Guide*.

WARNING Although the printer is optional with the Acuity LT system, be aware that there is no physical record available for Acuity events such as alarms without a printed paper copy.

2 Planning the Installation

Understanding the Acuity LT Wireless System

The Acuity LT wireless system displays the vital signs from patient monitoring devices on the Acuity LT Central Station. Network components included with the system enable connections to wireless patient-monitoring devices and a laser printer. The system also stores patient data through the Full Disclosure feature. This feature automatically stores all trend information for all patients for up to 24 hours.


Access Points provide connection between the Ethernet network and wireless devices
Propaq LTR wireless patient monitors communicate through Access Points
Micropaq wearable monitors and **Wireless Propaq CS** portable monitors communicate through Access Points
Switch connects the multiple Access Points and the CPU
Laser Printer provides printouts of stored patient data and alarms
Uninterruptible Power Supplies (UPSs) provide temporary power during power outages
Acuity Central Station is composed of the **Display** and **CPU** that monitors all connected patients The optional 28-patient system includes a second **Display**
External Modem connects to the CPU to facilitate remote technical support

Acuity LT Wireless System

Acuity LT Wireless System Components

The Acuity LT wireless system links Micropaq, Propaq LTR, and Propaq CS wireless portable patient monitors to the Acuity Central Station. The Acuity Central Station consists of a Sun Microsystems Workstation CPU and display. The CPU operates with Welch Allyn's Acuity LT wireless system software. Patient data, alarms and equipment alerts are presented on the display.

The wireless monitors communicate through an internal radio card to a Wireless Local Area Network (WLAN) using international standard IEEE 802.11. This product operates within the 2.4GHz RF spectrum (super high frequency). It uses Frequency Hopping Spread Spectrum (FHSS) technology to establish bi-directional data linkage to an Access Point (AP). The APs provide the conversion from wireless to wired communication through connection to an Ethernet switch using international standard IEEE 802.3. The switch then connects to the CPU using standard Ethernet 10 Base-T.

As each wireless monitor is moved throughout the facility, network communication automatically transitions between APs without disruption of service, provided that the APs are properly located in the facility.

The CPU, APs, and monitors are configured with an 802.11 Extended Service Set ID (ESSID) or "Network Name" unique to the Acuity LT system (such as "com8.protocol"). The Network Name for the CPU and APs must be configured at the factory. The Network Name for each wireless monitor can be set locally. (See "Monitor Network Name (ESSID)" on page 43 to set the wireless monitor Network Name.) If a facility has more than one Acuity LT system, the CPU, AP, and wireless monitors must be configured at the factory with a different Network Name to prevent interference between networks.

In addition to the Network Name, each AP is uniquely configured with a number to distinguish it from other APs in the network. Each AP is uniquely labeled and must be factory-configured.

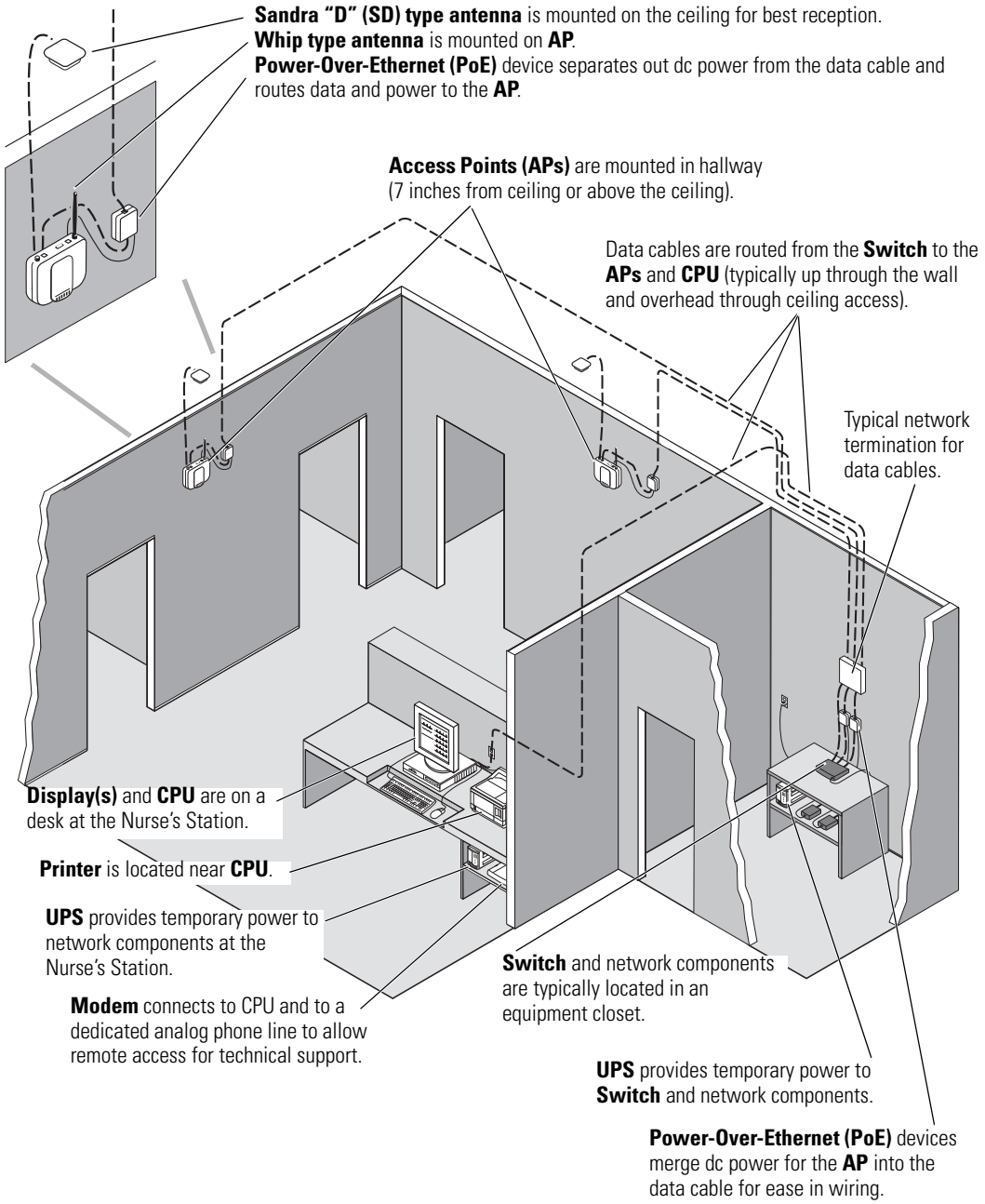
Each AP has two antennas, the Sandra "D" (SD) type and the whip type antenna. For best reception, the SD is typically mounted on the ceiling in a horizontal orientation, and the whip type is mounted vertically on the AP.

An external modem is connected to the CPU and a dedicated analog phone line. Modems can vary according to the telecommunication requirements in different countries. The modem allows remote technical support if required.

The Acuity LT wireless system capability can be expanded to support up to 28 patients. This system includes a second display with trackball, and a standard quantity of four APs (expandable to a total of seven APs).

Plan the Location of Equipment

The following illustration shows some typical locations for installation of the Acuity LT wireless system components.


Sandra "D" (SD) type antenna is mounted on the ceiling for best reception.
Whip type antenna is mounted on **AP**.
Power-Over-Ethernet (PoE) device separates out dc power from the data cable and routes data and power to the **AP**.
Access Points (APs) are mounted in hallway (7 inches from ceiling or above the ceiling).
Data cables are routed from the **Switch** to the **APs** and **CPU** (typically up through the wall and overhead through ceiling access).
Typical network termination for data cables.
Display(s) and **CPU** are on a desk at the Nurse's Station.
Printer is located near **CPU**.
UPS provides temporary power to network components at the Nurse's Station.
Modem connects to CPU and to a dedicated analog phone line to allow remote access for technical support.
Switch and network components are typically located in an equipment closet.
UPS provides temporary power to **Switch** and network components.
Power-Over-Ethernet (PoE) devices merge dc power for the **AP** into the data cable for ease in wiring.

Plan the Location of Your Access Points

It is extremely important to carefully select the locations where you install the Access Points (APs) so that they can provide the best radio reception and network coverage for your facility.

Radio reception depends on two factors:

1. Distance between the AP and wireless patient monitor.
2. Amount and type of obstructions between the AP and wireless patient monitor.

   APs and wireless monitors generally communicate best in a "line-of-sight" situation, with minimum obstructions between the APs and monitors.

   Obstructions between the APs and monitors reduce effective communication because radio signals lose strength when they pass through walls, doors, and other materials. While the APs and wireless monitors can overcome some amount of obstruction, too much obstruction results in intermittent or total disconnection.

Generally, the Acuity LT system APs and wireless monitors can effectively communicate up to a distance of about 60 feet within a medical facility with typical construction (such as wallboard wall and metal studs) and average obstructions.

Table 2. Common Obstructions

TYPE	DESCRIPTION
Minor Obstructions	Radio signals can generally penetrate these types of obstructions without a severe loss of signal strength.
Typical partition walls (sheetrock/ wallboard, with metal studs) and non-metal doors.	APs and wireless monitors can generally communicate through at least two partition walls. Typically the metal studs are placed far enough apart to allow sufficient radio signals to pass through.
Curtains, mattresses, linens, suspended ceiling tiles, plain glass windows.	No serious problem.
Major Obstructions That Should Be Avoided	These obstructions can completely prevent effective communication.
Any large amount of metal	Large metal equipment, metal lockers, or metal cabinets.
Load-bearing walls, stairwells, fire walls, metal-clad fire doors, elevators, and elevator foyers, wire-mesh windows.	These are generally constructed with a lot of metal and metal reinforcements. They also extend above partition walls and suspended ceilings to the structural floor above which increases the obstruction.
Shielded rooms such as Radiology.	The shielding typically prevents any transmission of radio signals.
Large concentrations of water, such as a storage closet with large amounts of saline solution.	Water and other liquids severely obstruct radio signals.
Sources of radiation such as x-ray machines, microwave ovens, or other wireless network antennas.	To reduce interference, keep Acuity LT AP antennas at least 7 feet away from other network antennas or other sources of radiation.

Installation Plan Examples

The following examples show some typical Acuity LT system layouts. These examples are for illustration only, and are not a guarantee of actual coverage. The actual network coverage in each facility depends on the amount and type of obstructions, including the type of wall, floor, and ceiling construction and materials, number of walls between the monitor and AP, and type of equipment and supplies in the area.

Optional Equipment Closet

Note that although the examples show the Switch, PoEs, and a UPS located in a nearby equipment closet, the equipment closet is optional.

- This equipment can be located by the Acuity LT Central Station at the Nurse's Station if there is adequate space.
- Alternatively, this equipment can also be located as far as 300 feet away from the Acuity LT Central Station (300 feet is the maximum length of physical wiring allowed between the Switch and the CPU).

Critical Importance of AP Location

As shown in the examples, each AP can communicate with wireless monitors up to a distance of about 60 feet with typical obstructions. When APs are properly located, the Acuity LT system automatically provides seamless network coverage as the monitors are moved throughout the facility.

It is extremely important to locate APs properly so that there is adequate overlap between AP locations and no gap in network coverage.

- APs must be located between 6 feet and 40 feet from each other.

  If APs are closer than 6 feet, one AP may overload the input of the other, even though the APs are operating at different frequencies.

  If APs are farther apart than 40 feet, there can be gaps in network coverage as wireless patient monitors are moved throughout the facility. If you have more than two APs, each AP should be no farther than 40 feet from the nearest AP.

- Locate APs and AP antennas at least 2 feet away from any space where people frequent. For example, installation on an 8-foot ceiling is acceptable, but on top of the desk at the Nurse's Station is not.

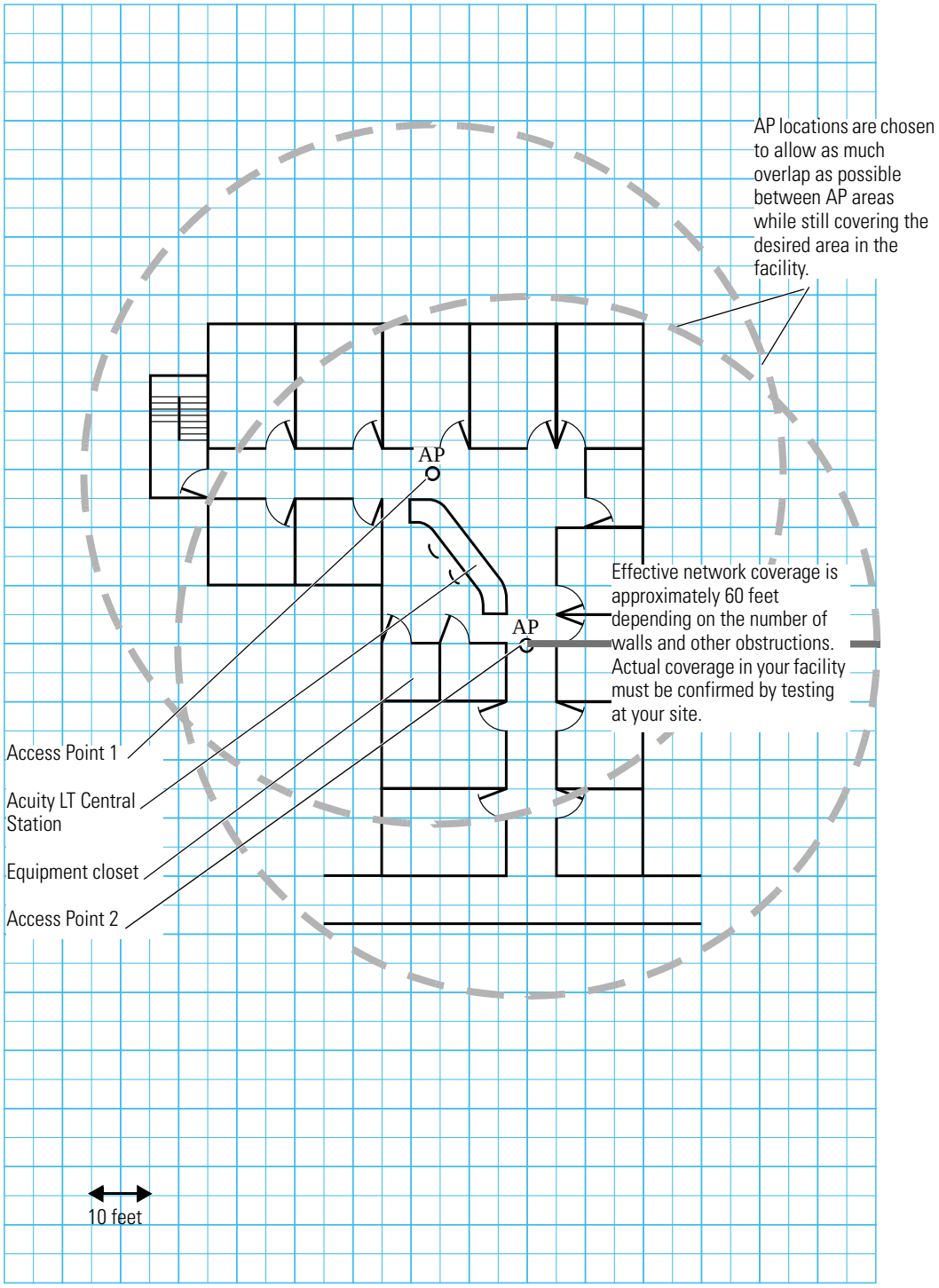
WARNING Do not install an Access Point or Access Point antenna closer than 2 feet from any location where people frequent. Installation closer than 2 feet could result in exposure to levels of radio frequency energy that are higher than recommended by the Federal Communications Commission (FCC).

Note If the standard number of APs provided with the Acuity LT Wireless System do not provide adequate network coverage for your facility, it is possible to add more APs to your system (up to a maximum total of seven). See "Installing Additional APs" on page 49.

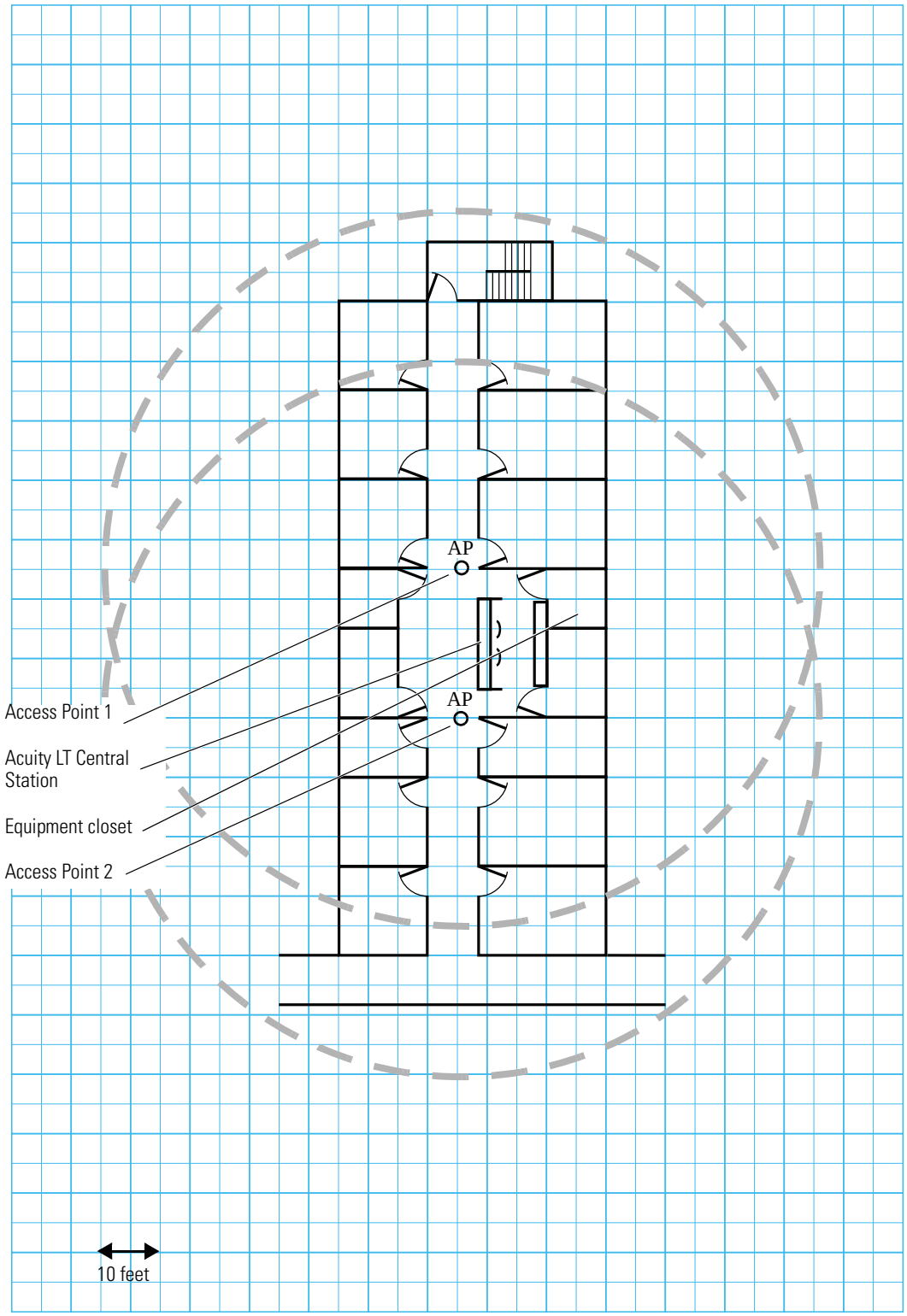
After you have installed the Acuity LT system, it is very important to complete the Final System Operation checklist ("Step 4 - Check Final System Operation" on page 26). The

checklist includes confirmation of adequate wireless communication throughout all areas of your facility, and confirms that your APs are properly located and operating.

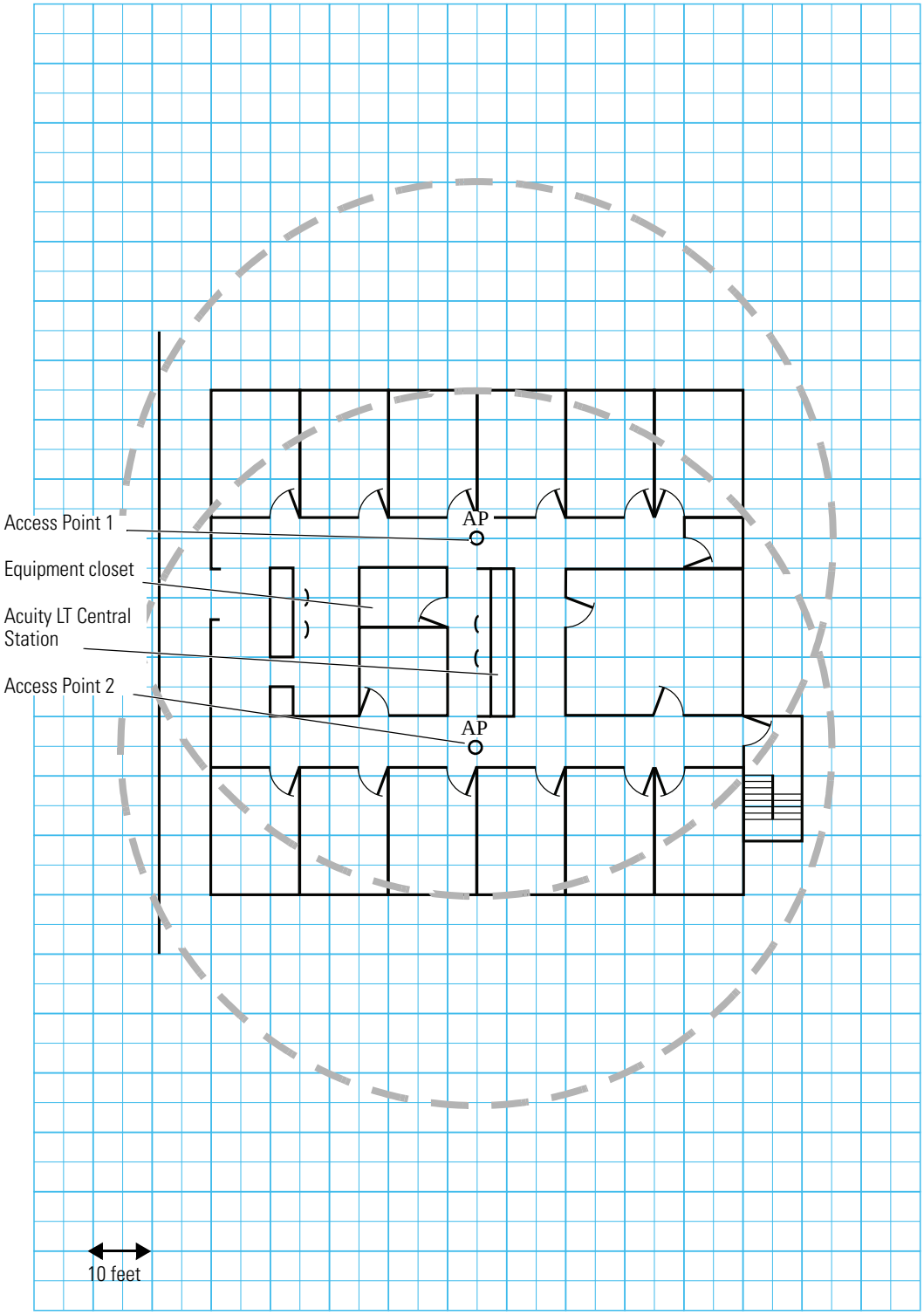
Example 1 - L-Shape Floor Plan


AP locations are chosen to allow as much overlap as possible between AP areas while still covering the desired area in the facility.
AP
AP
Effective network coverage is approximately 60 feet depending on the number of walls and other obstructions. Actual coverage in your facility must be confirmed by testing at your site.
Access Point 1
Acuity LT Central Station
Equipment closet
Access Point 2
10 feet

Example 2 - Single-Corridor Floor Plan



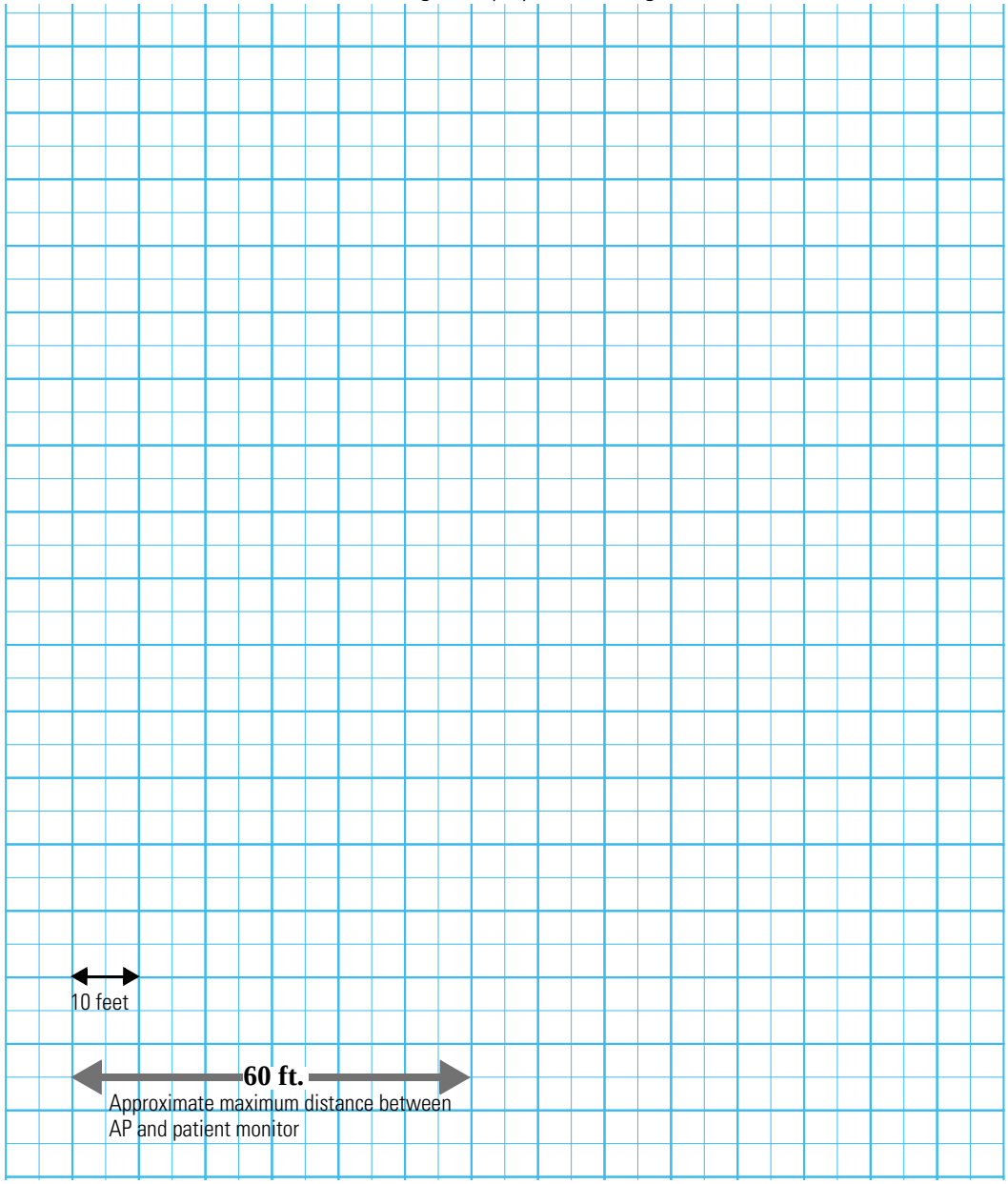
Example 3 - Double-Corridor Floor Plan



Installation Worksheet for Your Facility

Use this worksheet to identify the locations for the equipment and APs for your facility. Be sure to consider:

- All of the factors about obstructions and network coverage ("Common Obstructions" on page 6).
- 60 feet is the approximate maximum distance between AP and monitor for effective network coverage assuming standard construction. Actual network coverage will vary according to each facility, and must be tested on site.
- APs must be located between 6 feet and 40 feet from each other (for systems with more APs, each AP must be within 40 feet of another AP).
- 300 feet is the maximum length of physical wiring between Switch and CPU.
- 300 feet is the maximum length of physical wiring between Switch and AP.



3 Installing the Wiring

Install Wiring for all Equipment

After you have planned your installation and decided where your Acuity LT equipment will be located, you can have qualified personnel install the wiring for the Acuity LT Wireless System equipment in the appropriate locations.

All wiring must be installed in compliance with local and state safety guidelines and the following specifications:

Table 3. Wiring Requirements for Acuity LT Wireless System

Data Communication	Intended Service	Requirements
Local Area Network (Ethernet)	High-speed communications between CPU, Switch, and Access Points	Unshielded twisted-pair (4 pair) cabling (Category 5 or 5E) terminated per TIA/EIA-568 standards.
Telephone/data	Serial communication via external modem between CPU and Technical Support at Welch Allyn	Dedicated, analog, stand-alone Direct Inward Dial (DID) telephone line, not controlled by local PBX or switchboard or routed through telephone switchboard; terminated with standard telephone jack.

Table 4. Wiring Instructions

Equipment	Instructions
Access Points (APs)	• Be sure to leave at least 15 feet of extra cable at the location where each AP is to be installed. This will allow you to adjust the AP location during your network testing to enable you to identify the best AP location for communication with the monitors. • Do not install the AP mounting brackets. They will be installed later when the APs are permanently installed.
CPU	• Be sure to install a network terminal for the CPU.
Switch and network terminal in equipment room	• To aid in troubleshooting, label network terminal ports in the equipment room for data cables that will be plugged into the Switch from the CPU and the APs.

Table 4. Wiring Instructions (continued)

Equipment	Instructions
Wiring	
Maximum length of physical wiring between CPU and Switch	300 feet
Maximum length of physical wiring between Switch and each AP	300 feet
Minimum installation distance between APs	6 feet
Maximum installation distance between APs	40 feet
Minimum installation distance between AP/AP antennas and high-use work areas (see the Warnings on page 7)	2 feet

Table 5. Power Requirements for Acuity LT Wireless System Equipment

Location	Equipment Installed	AC Power Outlets Required	Minimum Power Requirements
Central Nurses Station	Display	1 power cord plugs into UPS	(Plug into UPS)
	Second Display (only for 28-patient system)	1 power cord plugs into UPS	
	CPU	1 power cord plugs into UPS	
	External Modem	1 power cord plugs into UPS	
	Uninterruptible Power Supply (UPS)	1 outlet	500 VA (750 VA required for larger capacity UPS for 28-patient system)
	Printer	1 outlet (does NOT plug into UPS)	Refer to printer specifications (printer model may vary)
Equipment closet (near Nurses Station)	Switch	1 power cord plugs into UPS	(Plug into UPS)
	Power-Over-Ethernet (PoE) devices (supply power to Access Points)	1 power cord for each PoE power adapter plugs into UPS (1 PoE power adapter for each AP)	
	Uninterruptible Power Supply (UPS)	1 outlet	500 VA
	Second Uninterruptible Power Supply (UPS) required with 4 to 7 APs to accommodate additional PoE power adapters	1 outlet	500 VA
Hallways	Access Points	Not required	Not applicable (power is provided from Power-Over-Ethernet devices through the data cables)

4 Installing the System

Step 1 - Unpack

1. Carefully unpack the Acuity LT system.
2. Locate and identify all the components. Standard components as well as the optional printer and uninterruptible power supplies are shown in the illustration and listed in Table 6 on page 16.

Table 6. Equipment List for Acuity LT Wireless System

Equipment	Item	Description	Typical Installation Location
Display	A	Flat Panel Display	Desk at nurses station
		AC power cord (not shown)	
		Data cable for connection to CPU, HD15-HD15 (not shown)	
		External audio cable (not shown; allows adjustment of Display speaker volume)	
		The 28-patient system also includes (not shown): • Second Flat Panel Display • AC power cord • Second data cable for connection to CPU (HD15-DVI) • Two video extension cables (to extend distance between CPU and Displays)	
CPU	B	Sun Microsystems SunBlade 150	Desk at nurses station
	B1	Keyboard (with USB connector)	
	B2	Mouse (with USB connector) OR Trackball with USB connector for 28-patient system (not shown)	
		AC power cord (not shown)	
Printer	C	Parallel printer (model may vary from what is shown)	Desk at nurses station
		AC power cord (not shown)	
		Parallel printer cable for connection to CPU (not shown)	
Switch	D	Milan 8-Port Switch (with AC power cord not shown)	Equipment closet near nurses station
		AC power cord (not shown)	
	D1	Data cable (for connection to CPU)	
	D2	Ground cable (connects to back of Switch and to building ground)	
2 Access Points (can be expanded to maximum of 7 APs)	E	Symbol Technologies AP-3020/AP-3021	Central hallways near ceiling (on mounting brackets)
	E1	2 Sandra "D" (SD) antennas	Mounted on ceiling by AP
	E2	2 Whip antennas	Attached to AP
	E3	2 Mounting brackets (for mounting APs on wall)	Central hallways near ceiling
4 Power-Over-Ethernet (PoE) devices (additional APs require additional PoE devices, power adapters, power cables, power cords, and data cables)	F	4 Spectrum 24 BIAS-T Power-Over-Ethernet (PoE) devices (2 PoE devices for each Access Point)	For each AP, one PoE is in equipment closet, one PoE is by the AP
	F1	2 PoE power adapters (to provide AC-to-DC power to 2 local PoE devices in equipment room)	By PoE devices in equipment closet
	F2	2 DC power cables (for connection between each AP and remote PoE)	By APs
	F3	2 AC power cords (for connection to local PoE power adapters and UPS)	By PoE power adapters in equipment closet
	F4	Ethernet data cables (for connection to PoE adapters, Switch, and APs)	In equipment closet and by AP

Table 6. Equipment List for Acuity LT Wireless System (continued)

Equipment	Item	Description	Typical Installation Location
2 Uninterruptible Power Supplies (Third UPS required for systems with 4-7 APs)	G	Uninterruptible Power Source (UPS) to provide emergency power to system components (model may vary) For 28-patient system, the addition of the second Display requires the 750 VA UPS.	One UPS near desk at nurses station, one UPS in equipment closet (third UPS in equipment closet for systems with 4-7 APs)
	G1	Ground cables (connect to back of UPS and to building ground)	
Modem	H	Modem for connection to CPU and dedicated analog phone line to allow remote technical support (model may vary)	Near desk at nurses station
	H1	Power adapter	
	H2	AC power cord	
	H3	Data cable (for connection to modem and CPU	
	H4	Phone cord (for connection to modem LINE connector and dedicated phone line)	
	H5	Noise suppressor (attaches around phone cord)	

Step 2 - Set Up and Check Preliminary System Operation

Before you install the equipment, it is strongly recommended that you first set up and connect all Acuity LT system components. This allows you to see how all the system components work together, and confirm that all components are working properly in your facility.

To complete this preliminary system check, you will need a Micropaq or Wireless Propaq CS monitor.

Follow these steps.

1. Choose a suitable location with available power and a large desk or table such as a conference room or office.

   Do not apply power (or plug the UPSs into ac power) until instructed in Step 3 on page 19.

2. Connect the components as shown in Figure on page 18.

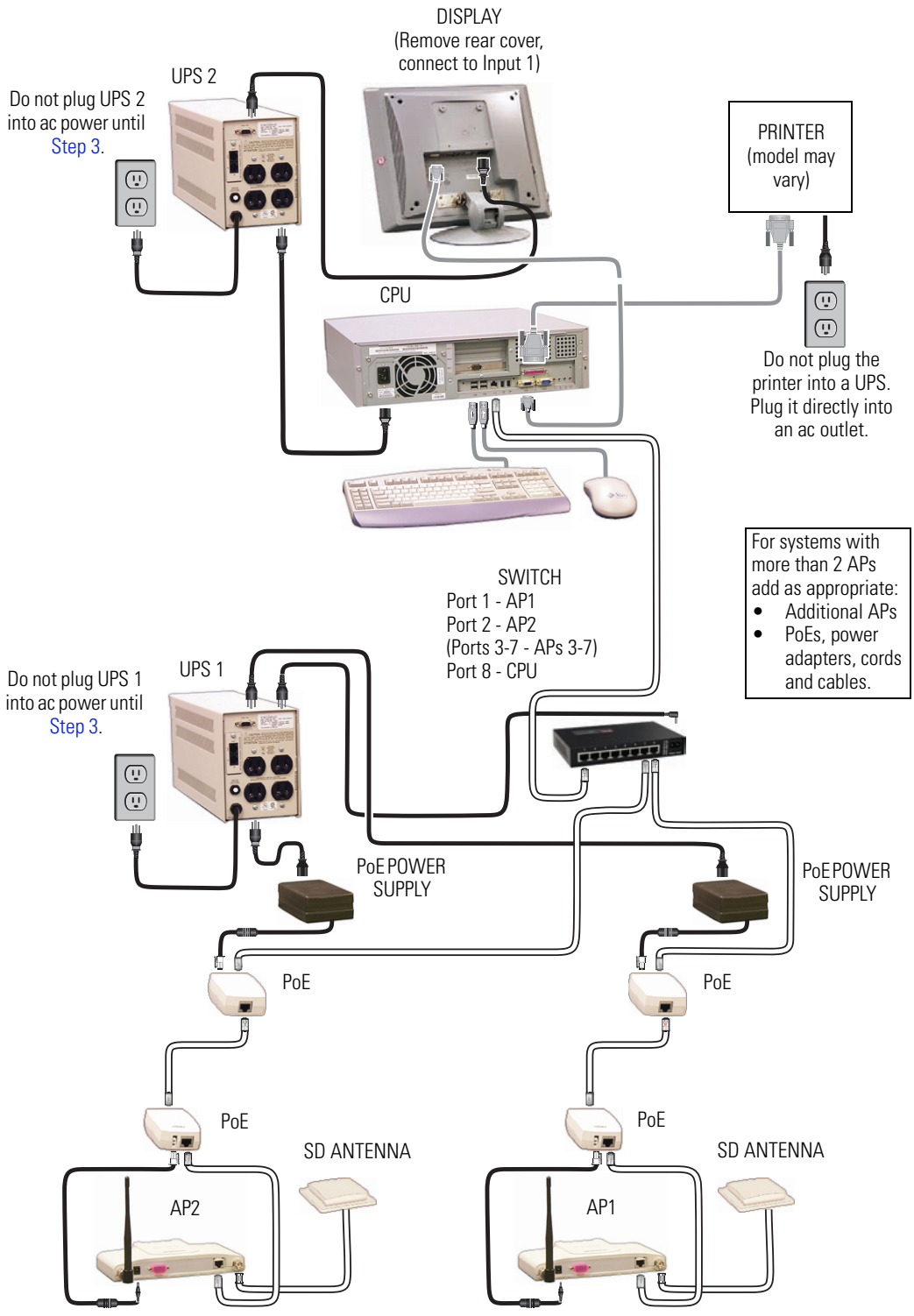
   Do not plug the printer into a UPS.

   Before connecting the printer, you may need to insert the toner cartridge and add paper.

   For help in identifying equipment and accessories, refer to Figure on page 15 and Table 6 on page 16.

   Note that you do **not** need to assemble the following equipment for this preliminary system check:

   - 3 Ground cables (Items D3 and G1)
   - 2 Mounting brackets (Items E3)
   - Modem and accessories (Items H and H1 through H5)


DISPLAY
(Remove rear cover, connect to Input 1)
UPS 2
Do not plug UPS 2 into ac power until Step 3.
PRINTER (model may vary)
CPU
Do not plug the printer into a UPS. Plug it directly into an ac outlet.
For systems with more than 2 APs add as appropriate:
• Additional APs
• PoEs, power adapters, cords and cables.
SWITCH
Port 1 - AP1
Port 2 - AP2
(Ports 3-7 - APs 3-7)
Port 8 - CPU
UPS 1
Do not plug UPS 1 into ac power until Step 3.
PoE POWER SUPPLY
PoE POWER SUPPLY
PoE
PoE
PoE
PoE
SD ANTENNA
SD ANTENNA
AP2
AP1

Preliminary Wiring Connections for the Acuity LT Wireless System

3. After you have connected all equipment, apply power in this order:

Printer	Plug into ac power. **Do not plug the printer into a UPS.** Turn on the printer power switch (power switch may be in the rear; see printer manual for location).
UPS 1	Plug the UPS 1 power cord into an ac outlet. Turn UPS 1 power switches on to apply power to the Switch, PoEs, and APs (check UPS manual for switch locations).
	Additional UPS (if an additional UPS is needed for 4-7 APs)
	Plug the UPS power cord into an ac outlet.
	Turn UPS power switches on to apply power to the Switch, PoEs, and APs (check UPS manual for switch locations).
UPS 2	Plug the UPS 2 power cord into an ac outlet.
	Turn on UPS 2 power switches (check UPS manual for switch locations).
	Turn on Display rear panel power switch.
	CPU should start up when UPS power is applied. (If not, press the CPU front panel power switch.)

4. Examine the following devices and confirm that LEDs are active, indicating power is applied.

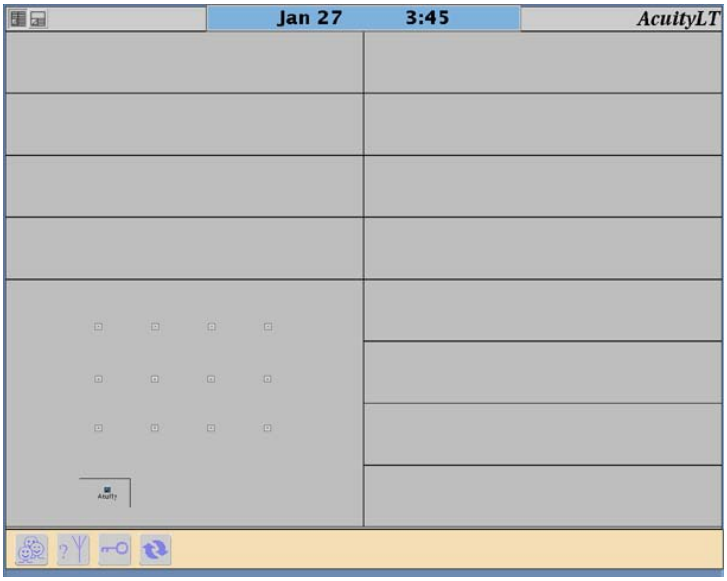
   UPSs, CPU, Switch, PoEs, APs

5. Look at the Display and confirm that information is being displayed.

   For a 28-patient system:

   - Look at the second Display and confirm that the information is being displayed.
   - Use the Acuity trackball and confirm that the displayed arrow moves properly left and right between the Displays. If not, reverse the Display cable connections at the rear of the Displays and confirm that the displayed arrow moves properly left and right between the Displays.

6. Within two or three minutes, confirm that Acuity displays a screen similar to the following:



If Acuity displays a CHECK NETWORK message, check all of the power and data cable connections to the CPU, Switch, APs, and PoEs. If the message is still displayed, refer to "Troubleshooting & Support" on page 37.

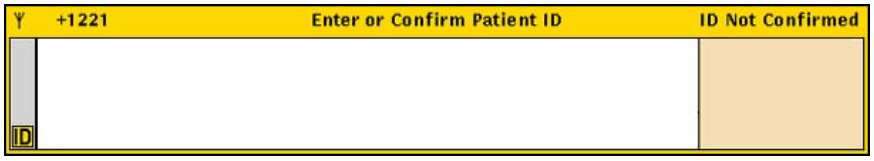
For a 28-patient system, confirm that the "map" in the lower left corner displays icons for 28 monitors.

7. Apply power to a Micropaq, Propaq LTR, or Propaq CS wireless monitor (make sure no patient cables are connected to the monitor).

   If you are using a Propaq LTR monitor, select the internal simulation mode (Demo mode):

   - Highlight **Demo** and press ⊙.
     (If the monitor has data stored for a previous patient, you must delete the patient data and restart the monitor before you can access the Demo mode.)

8. Confirm that within a minute Acuity displays a Patient ID Setup Window similar to the following:



   - If the monitor does not appear to connect to Acuity, check the Network Name (ESSID) listed on the left side of the CPU near the manufacturer's serial number. (The Network Name will be similar to "com8.protocol").
   - Then check the Network Name assigned to the monitor (see "Monitor Network Name (ESSID)" on page 43). If the monitor Network Name is not the same as shown on the CPU label, follow the procedure in Appendix B to reassign the appropriate Network Name. Then confirm that within a minute Acuity displays a Patient ID Setup window for the monitor.
   - If the Propaq LTR monitor does not display the wireless connection icon (either ᛉ or ᛉ), the monitor may be configured so that the wireless connection is disabled (radio card is off). If so, the monitor must be reconfigured to enable it. Refer to the *Propaq LTR Directions For Use* for more information.

9. If you are using a Micropaq or Propaq CS monitor, select the internal simulation mode:

   Micropaq:

   - Press **Scroll Down** as needed to highlight **SERVICE MENU**, and then press **Select**.
   - Press **Scroll Down** to highlight **DEMO MENU**, and then press **Select**.
   - Press **Scroll Down** to highlight **DEMO 1**, and then press **Select** to start DEMO 1 Mode.

   = Scroll Down

   = Select

   Wireless Propaq CS:

   - Press **SETUP**, **WAVE SELECT**, **INSERVICE**.

10. Confirm that within a minute Acuity displays simulated patient data in the waveform window.

11. Set the monitor to the alternate internal simulation mode to cause an alarm:

    Micropaq:

    - Press **Scroll Down** as needed to highlight **TOGGLE DEMO MODE**, then press Select (this selects DEMO 2 Mode, thereby causing an alarm condition).

    Propaq LTR:

    - Highlight **SpO2** and press ⊙.
    - Highlight **Setup** and press ⊙ to access the **Setup** menu.
    - Highlight **Timings**, then scroll to highlight **Demo Mode**.
    - Highlight **High**, then press ⊙ to return to the main display (this selects the alternate simulation mode, thereby causing an alarm condition).

    Wireless Propaq CS:

    - Press **SETUP**, **WAVE SELECT**, **INSERVICE** (this selects the alternate simulation mode, thereby causing an alarm condition).

12. Confirm that within a few seconds Acuity displays a red-bordered alarm screen and emits an audio alarm.

13. Use the Acuity mouse/trackball left-button to click Suspend on the Acuity alarm screen, and then confirm that the audio alarm is off.

14. Set the monitor to the alternate internal simulation mode, and confirm that this removes the red-bordered alarm condition (the yellow waveform window is displayed):

    Micropaq:

    - Press **Scroll Down** as needed to highlight TOGGLE DEMO MODE, then press **Select** (this selects DEMO 1 Mode, thereby removing the alarm condition).

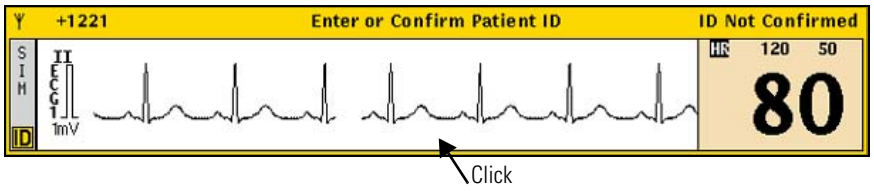
    Propaq LTR:

    - Highlight **SpO2** and press ⊙.
    - Highlight **Setup** and press ⊙ to access the **Setup** menu.
    - Highlight **Timings**, then scroll to highlight **Demo Mode**.
    - Highlight **Low**, then press ⊙ to return to the main display (this selects the first simulation mode, thereby removing the alarm condition).

    Wireless Propaq CS:

    - Press **SETUP, WAVE SELECT, INSERVICE** (this selects the first simulation mode, thereby removing the alarm condition).

15. Use the Acuity mouse/trackball left-button to click in the waveform area of the waveform window, then confirm that within 2 minutes the printer prints the simulated patient data from the monitor.



- If the printer does not print, make sure it is on-line and properly connected.

16. Unplug both UPS units from AC power (this may cause the UPS units to emit an audible alarm). Confirm that the system continues to operate without disruption. Plug both UPS units back into AC power.

17. Apply power to all the wireless monitors that will be used with the Acuity LT system (maximum 12 active monitors at one time, or 28 active monitors for a 28-patient system). Confirm that within a minute Acuity displays a waveform window for each monitor.

18. Disconnect all of the monitors from Acuity:

Micropaq:

- Press **Scroll Down** as needed to highlight **ACUITY**, and press **Select**.
- Press **Scroll Down** as needed to highlight **END TELE**, and press **Select**.

  When the SAFE TO REMOVE BATTERY message is displayed, remove the battery.

Propaq LTR:

- Press ⏻.
- Highlight **Delete & Shutdown** and press ⊙.

Wireless Propaq CS:

- From the Main Menu press **SETUP**, **ACUITY**, **END TELE**, and turn off power.

19. Shut down the Acuity LT system as follows:

- On the Acuity keyboard, hold down the "diamond" key (next to the space bar), then move the Acuity mouse/trackball to "AcuityLT" in the upper right corner of the Display and click the right mouse/trackball button.
- Click "Shutdown Workstation", then click "Confirm".
- After the Display indicates the system is off, turn off all power and disassemble the system.
- If any part of the system is not operating properly, refer to "Troubleshooting & Support" on page 37.

If the wiring has been installed in your facility, you can now install the equipment in your facility as described in "Step 3 - Set Up and Connect the Equipment" on page 23. (If wiring has not been installed, store the equipment until you are ready for the installation.)

Step 3 - Set Up and Connect the Equipment

1. Place all of the equipment in the locations you previously identified during the planning process.

   Access Points

   - Temporarily hang APs in the hallway in the intended location. Do not permanently mount the AP mounting brackets or SD antennas. You will permanently install them after you have tested the network coverage in the Final System Check.
   - For network testing, make sure the SD antennas are temporarily positioned horizontally at the ceiling, and the whip antenna on the AP is positioned vertically.

2. Connect all of the components with appropriate data cables and power connections as illustrated on page 24.

   Do not apply power (or plug the UPSs into ac power) until the final System Check on page 26.

   Do not plug the printer into a UPS. Plug the printer directly into an ac power outlet.

3. Connect the ground cables (not illustrated).

   - Connect ground cable from Switch to building ground.
   - Connect ground cable(s) from UPS(s) to building ground.

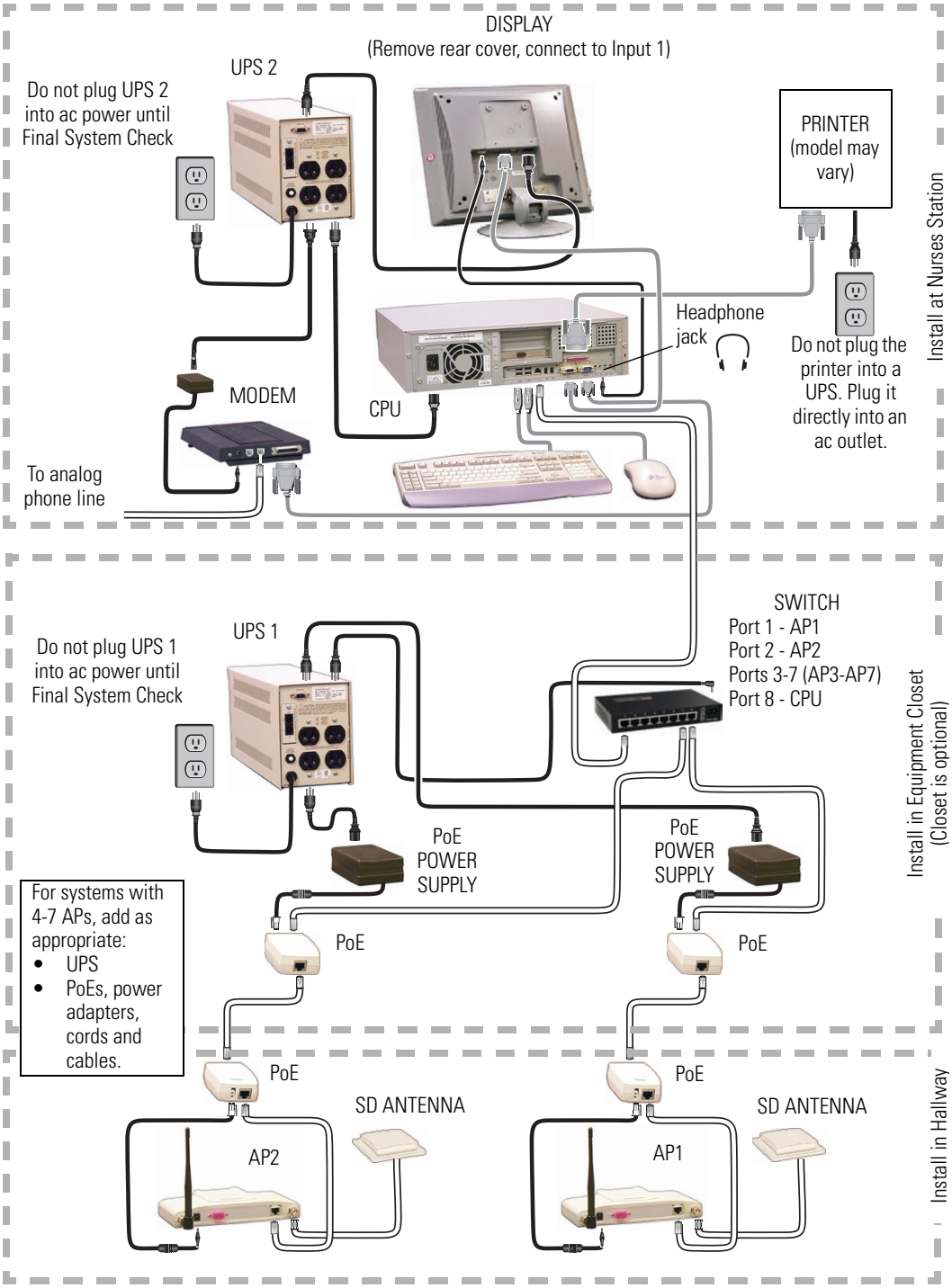
4. Connect the external audio cable.

   - CPU: Connect to rear-panel headphone jack:

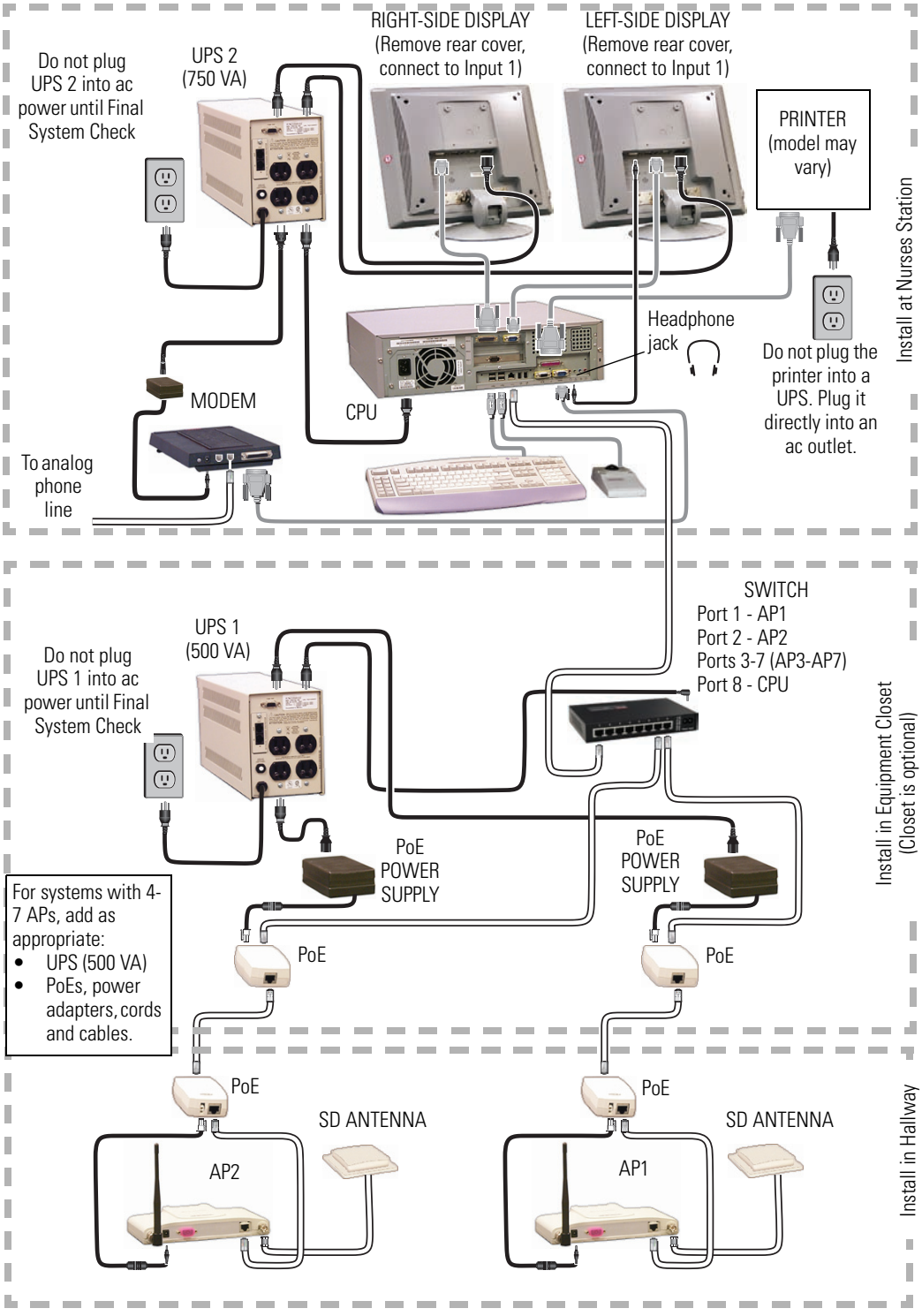
     Do NOT connect to CPU line-out jack:

   - Display: Connect to rear-panel Input 1 Audio jack.

     For 28-monitor system, be sure to connect to the left-side Display (the Display with the Acuity map).



Final Wiring Connections for the Acuity LT Wireless System (12 Patients)



Final Wiring Connections for the Acuity LT Wireless System (28 Patients)

Step 4 - Check Final System Operation

Perform all of the steps in this table to make sure the Acuity LT wireless system is operating properly. This system check may require 2-3 hours to complete, depending on your facility. You will need:

Micropaq, Propaq LTR, or Wireless Propaq CS patient monitor

If any part of the system is not working, refer to "Troubleshooting & Support" on page 37.

Table 7. Final System Check for Acuity LT Wireless System

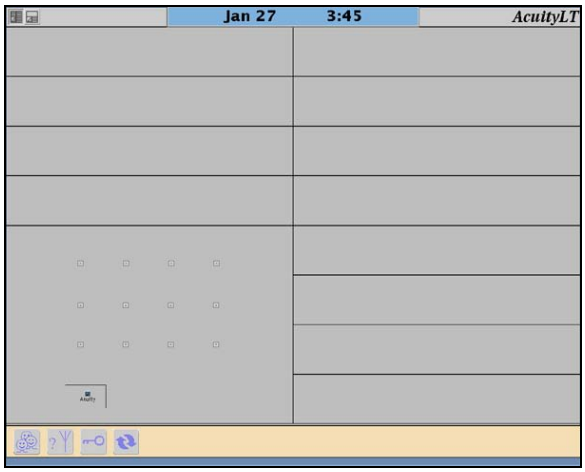
Step	Activity to Perform	Pass/Fail (Circle One)	Comments
1	Make sure all power is off (including all wireless monitors). Then apply power as follows: • Printer: Press printer power switch (switch may be in rear; see printer manual) and make sure it is on-line and has paper. • UPS 1 (In equipment room) • (Additional UPS if 4-7 APs) • UPS 2 (at Nurses Station) • CPU should start up when UPS 2 power is applied (if not, press CPU front panel power switch). • Display(s): Press rear panel power switch. Confirm that the Acuity LT system begins to start up with activity on the Display(s).	Pass/Fail	
2	Examine the following devices and confirm that device LEDs are active indicating power is applied. • UPSs, CPU, Switch, PoEs, APs	Pass/Fail	
3	Inspect the APs and confirm that within 2-3 minutes of receiving power the green Link LED (3rd LED from left on front of the AP) is continuously on.	Pass/Fail	
4	Confirm that Acuity LT displays a screen similar to the following, and that the "CHECK NETWORK" message is NOT displayed.. 	Pass/Fail	

Table 7. Final System Check for Acuity LT Wireless System (continued)

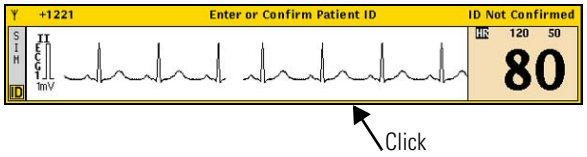
Step	Activity to Perform	Pass/Fail (Circle One)	Comments
4a	For 28-patient systems only: Confirm that Acuity LT presents information on both the left and right displays with the top row information similar to the screen shown in Step 4. Confirm that the "map" in the lower left corner of the Step 4 screen shows 28 icons (not 12). Confirm that the "map" is on the left side display. • If the map is on the right side display, go the rear of both display units and switch the display cable connections between the display units. • Confirm that the map is now on the left side display. • Confirm that you can use the trackball to move the arrow properly left and right between the displays.	Pass/Fail	
5	Apply power to a wireless monitor (Micropaq, Propaq LTR, or Wireless Propaq CS) and place it in Demo or Inservice mode: Micropaq: • Press **Scroll Down** as needed to highlight SERVICE MENU, then press **Select** • Press **Scroll Down** to highlight DEMO MENU, then press **Select**. • Press **Scroll Down** to highlight DEMO 1, then press **Select** to start DEMO 1 Mode. Propaq LTR: • Highlight **Demo** and press ⦿. Wireless Propaq CS: • Press **SETUP, WAVE SELECT, INSERVICE**. Place the monitor within 10 feet of an AP, then examine the Acuity LT Display and confirm that within 1 minute it displays simulated patient data from the monitor.	Pass/Fail	
6	At Acuity LT, click the left mouse/trackball button in the waveform area and confirm that within 2 minutes the printer prints simulated patient data.  	Pass/Fail	

Table 7. Final System Check for Acuity LT Wireless System (continued)

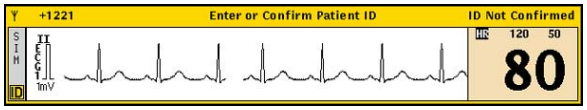
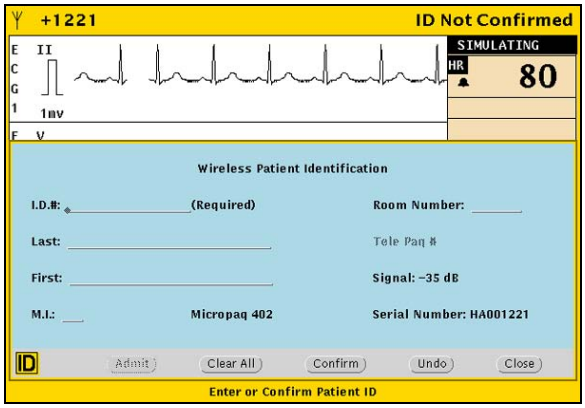
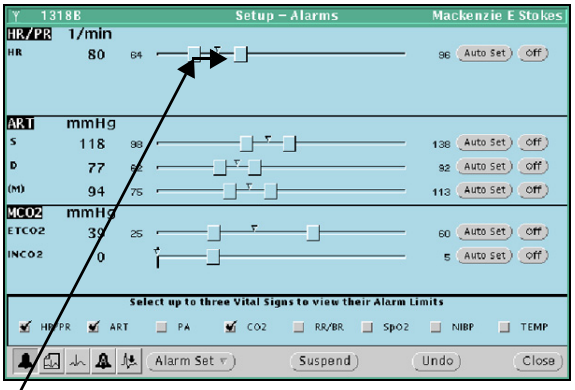
Step	Activity to Perform	Pass/Fail (Circle One)	Comments
7	Click the left mouse/trackball button on the status icon  and confirm that the ID Not Confirmed window is displayed.  +1221 ID Not Confirmed SIMULATING HR 80 Wireless Patient Identification I.D.#: (Required) Room Number: Last: Tele Pan # First: Signal: -35 dB M.I.: Micropaq 402 Serial Number: HA001221 Admit Clear All Confirm Undo Close Enter or Confirm Patient ID	Pass/Fail	
8	Click **Close**, then click **Setup ▼,** then **Alarms** to display the Alarms Setup Window:  1318B Setup – Alarms Mackenzie E Stokes HR/PR 1/min ART mmHg MCO2 mmHg Select up to three Vital Signs to view their Alarm Limits Alarm Set Suspend Undo Close Using the left mouse/trackball button, hold down the slider for the HR/PR lower alarm limit and move it to the right to 90 or greater, then release the button. Confirm that within a few seconds Acuity LT displays a red-bordered HR limit alarm screen, and emits an audible alarm.	Pass/Fail	
9	Confirm that you can hear the alarm from the Display speakers. Confirm that the speaker volume buttons on the Display allow you to increase and decrease the volume. Set the volume to an appropriate level. (Note that this adjusts only the volume of the Display speakers; it does not affect the CPU speaker volume which is controlled by the Acuity LT software.)	Pass/Fail	
10	Use the mouse/trackball to move the HR/PR lower alarm limit back down to below 80, then confirm that the alarm screen is removed and the audible alarm stops.	Pass/Fail	

Table 7. Final System Check for Acuity LT Wireless System (continued)

Step	Activity to Perform	Pass/Fail (Circle One)	Comments
11	Place the monitor within 10 feet of AP1. At the Switch, disconnect the data cables to all APs EXCEPT for AP1; leave AP1 connected to the Switch (Switch Port 1). Also leave the data cable for the CPU connected to the Switch (Switch Port 8). Confirm that within 3 minutes, Acuity LT displays the CHECK NETWORK message as well as simulated patient data from the monitor.	Pass/Fail	
12	Reconnect the data cables to all APs. Confirm that within 2 minutes the CHECK NETWORK message is no longer displayed.	Pass/Fail	
13	Repeat Steps 11 and 12 for all APs. Be sure to place the monitor within 10 feet of the AP that is connected. AP2 APs 3-7 (if included)	 Pass/Fail Pass/Fail	
14	Unplug UPS 1 (in the equipment closet) from ac power and confirm that the Acuity LT displays patient data with no alert messages. (The UPS may emit an audible alarm.) Plug UPS 1 back into ac power.	Pass/Fail	
14a	For systems with 4-7 APs only: Unplug additional UPS (in the equipment closet) from ac power and confirm that the Acuity LT displays patient data with no alert messages. (The UPS may emit an audible alarm.) Plug UPS back into ac power.	Pass/Fail	
15	Unplug UPS 2 (at the Nurses Station) from ac power and confirm that the Acuity LT displays patient data with no alert messages. (The UPS may emit an audible alarm.) Plug UPS 2 back into ac power.	Pass/Fail	
16	To check the modem, call Welch Allyn Technical Support (1-800-289-2501 or 503-530-7500). Provide the telephone number of the modem and ask the technician to check the modem operation.	Pass/Fail	
17	Measure the RSSI for your facility as described on "Measure RSSI for Your Facility" on page 30 and complete the "RSSI Measurement Chart" on page 32. Confirm that the RSSI for all locations is 50 or less. This step may require 1-2 hours to complete, depending on your facility.	Pass/Fail	

Test Performed By _____ Date _____

Facility _____

Measure RSSI for Your Facility

This procedure checks the effectiveness of the network coverage for the Acuity LT Wireless System as it is currently installed in your facility.

The network radio signal strength for a monitor is measured with a parameter called Received Signal Strength Indication (RSSI). The RSSI is displayed on the monitor's Network Status service screen. The RSSI value depends on the distance between the monitor and the AP to which it is connected, and any obstructions between them. In general, as the monitor is moved ***away*** from the AP it is connected to, the RSSI value ***increases*** (indicating ***less*** signal strength). For effective network communications with minimal dropout and disruption, the RSSI for any wireless monitor should be no higher than 50. The RSSI will vary slightly between wireless monitors, depending on the characteristics of the antenna and radio circuitry in the monitor.

In a properly working system, the monitor will maintain connection with the Acuity LT Wireless System as it is moved throughout the facility by automatically transitioning from a more distant AP to a closer AP without any detectable change in the display of patient data on the Acuity LT Display.

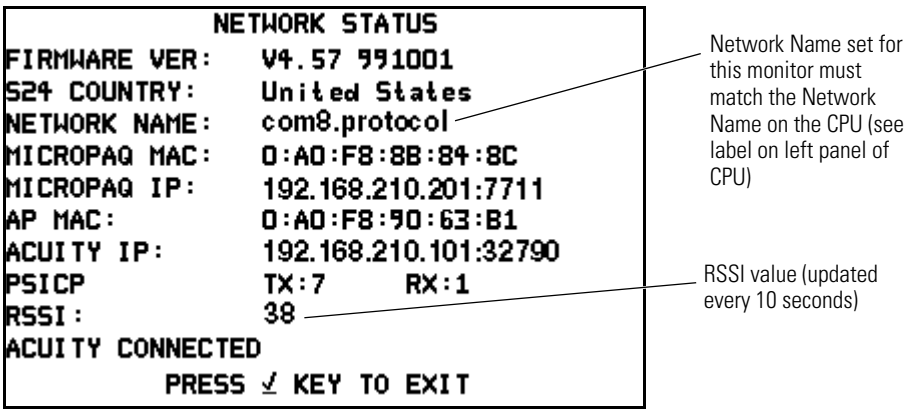
To measure a monitor's RSSI, perform these steps:

1. Make sure that Acuity LT Wireless System is operating properly as defined by the Final System Check up through Step 17 on page 29.
2. Make sure all APs are properly positioned in their desired locations.

   For best overall signal reception, make sure the SD antenna is oriented horizontally at the ceiling, and the whip antenna is oriented vertically on the AP.
3. Make sure a single wireless monitor is powered on and connected to Acuity LT.
4. Make a sketch of your facility's room layout in the RSSI Measurement Chart on page 32.
5. Access the monitor's Network Status screen to examine the monitor's RSSI.

   Micropaq

   - From the monitoring screen, press **Scroll Down** to access the Main Menu.
   - Press **Scroll Down** again to highlight **SYSTEM INFORMATION**, and press **Select** to display the System Information Menu.
   - Press **Scroll Down** twice to highlight N**ETWORK STATUS**, and press **Select**.


NETWORK STATUS
FIRMWARE VER: V4.57 991001
S24 COUNTRY: United States
NETWORK NAME: com8.protocol
MICROPAQ MAC: 0:A0:F8:8B:84:8C
MICROPAQ IP: 192.168.210.201:7711
AP MAC: 0:A0:F8:90:63:B1
ACUITY IP: 192.168.210.101:32790
PSICP TX:7 RX:1
RSSI: 38
ACUITY CONNECTED
PRESS ✓ KEY TO EXIT
Network Name set for this monitor must match the Network Name on the CPU (see label on left panel of CPU)
RSSI value (updated every 10 seconds)

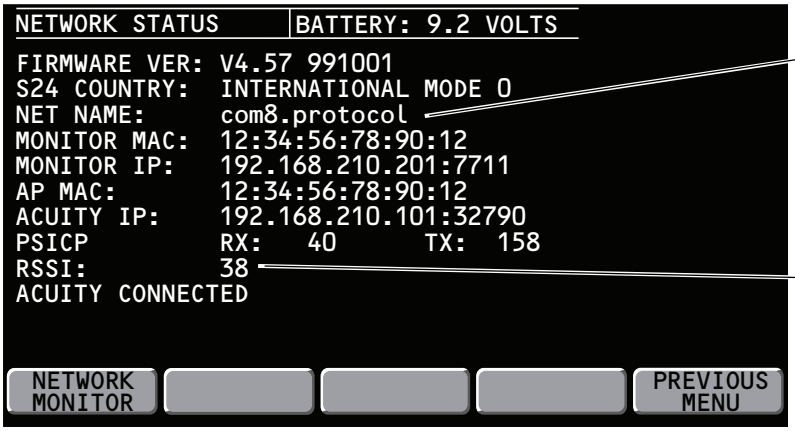
Propaq LTR

- From the main display, highlight **SpO2** and press ⦿.
- Highlight **Setup** and press ⦿ to access the **Setup** menu.
- Highlight **Service** and press ⦿ to access the **Service** menu.
- Highlight **Radio**, then highlight **Show Info** and press ⦿.

  The monitor displays the Net name (which must match the Network Name on the CPU left side panel label) and the RSSI value.

Wireless Propaq CS

- From the Main Menu press **SETUP**, **MORE**, **MORE**, **SERVICE**, **YES**, **MORE**, **MORE**, **RADIO STATUS**,


NETWORK STATUS
BATTERY: 9.2 VOLTS
FIRMWARE VER: V4.57 991001
S24 COUNTRY: INTERNATIONAL MODE 0
NET NAME: com8.protocol
MONITOR MAC: 12:34:56:78:90:12
MONITOR IP: 192.168.210.201:7711
AP MAC: 12:34:56:78:90:12
ACUITY IP: 192.168.210.101:32790
PSICP RX: 40 TX: 158
RSSI: 38
ACUITY CONNECTED
NETWORK MONITOR
PREVIOUS MENU
Network Name set for this monitor must match the Network Name on the CPU (see label on left panel of CPU)
RSSI value (updated every 10 seconds)

6. Move the monitor to the corner of a patient room in your facility. Wait at least 10 seconds in that location to make sure the RSSI is updated, then note the RSSI number.

   Be aware that the RSSI only updates every 10 seconds. You must wait at least 10 seconds in each location to make sure the actual updated RSSI is displayed.

7. Repeat the previous step as you move through various rooms and areas of your facility. Record all results on the RSSI Measurement Chart.

   - Check the RSSI in all four corners of each patient room. Record the highest RSSI on the Chart.
   - Check the RSSI in every patient bathroom.
   - Check the RSSI in ALL other areas where you require network coverage

   As you perform the testing, be sure to consider possible obstructions as described in "Plan the Location of Your Access Points" on page 6. Make sure you test in all areas that might have a lot of obstruction such as behind three or more walls or behind stairwells.

8. If you find that the RSSI is too high (> 50) in a particular location, try repositioning the nearest AP and SD antenna. (The AP data cable should have at least 15 feet of extra length to allow you to reposition it; the extra data cable length might be temporarily coiled above the ceiling.) Make sure the SD antenna is positioned horizontally at the ceiling, and the whip antenna is positioned vertically on the AP.

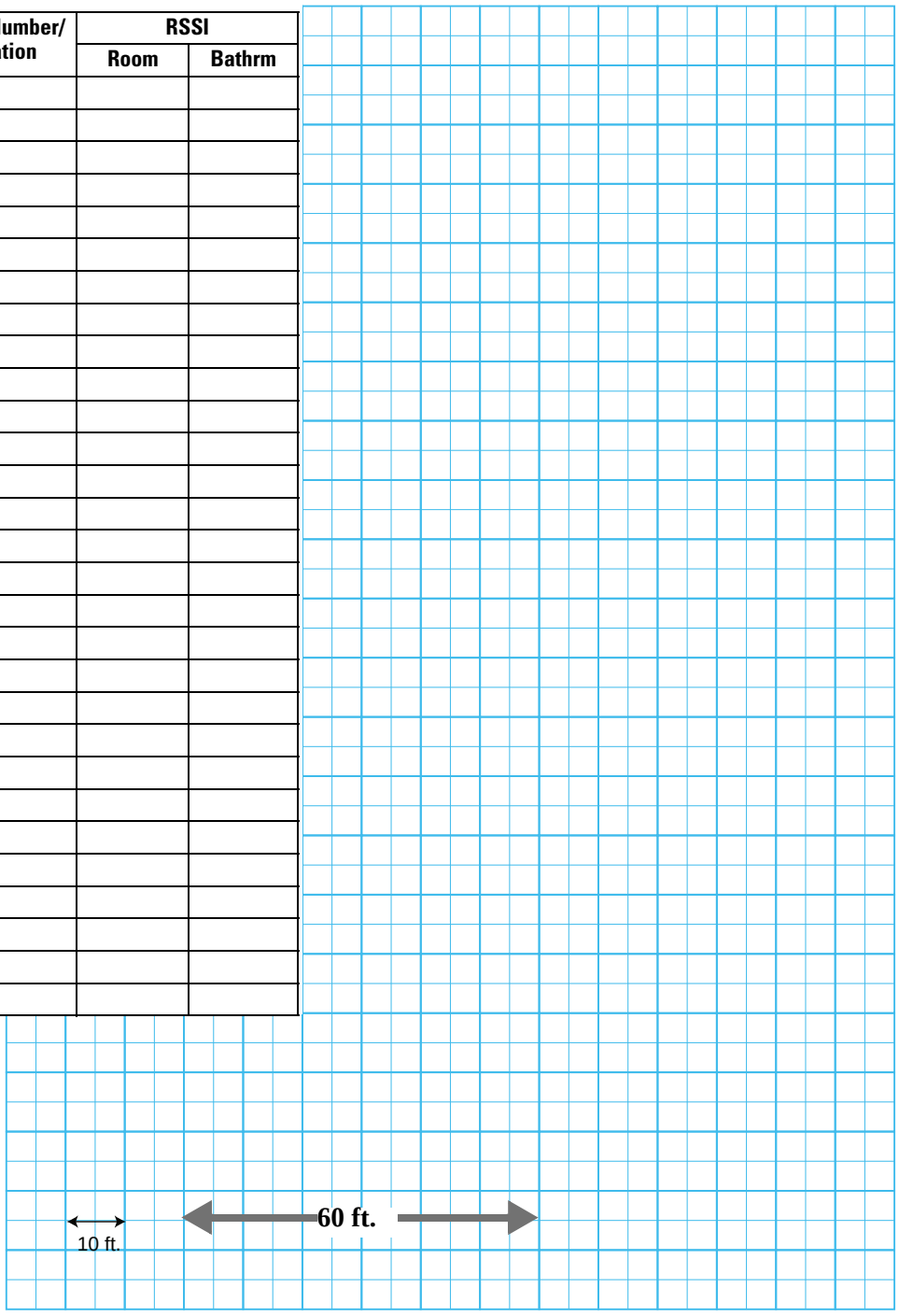
   Repeat the RSSI testing until you are satisfied that you have identified the best location for each AP.

When testing, be sure to place the APs close enough together to allow overlapping coverage and prevent gaps in network coverage. The APs should at least 6 feet apart, but no more than 40 feet apart.

9. Record the results of the RSSI testing on the Final System Check. The Final System Check is complete.

RSSI Measurement Chart

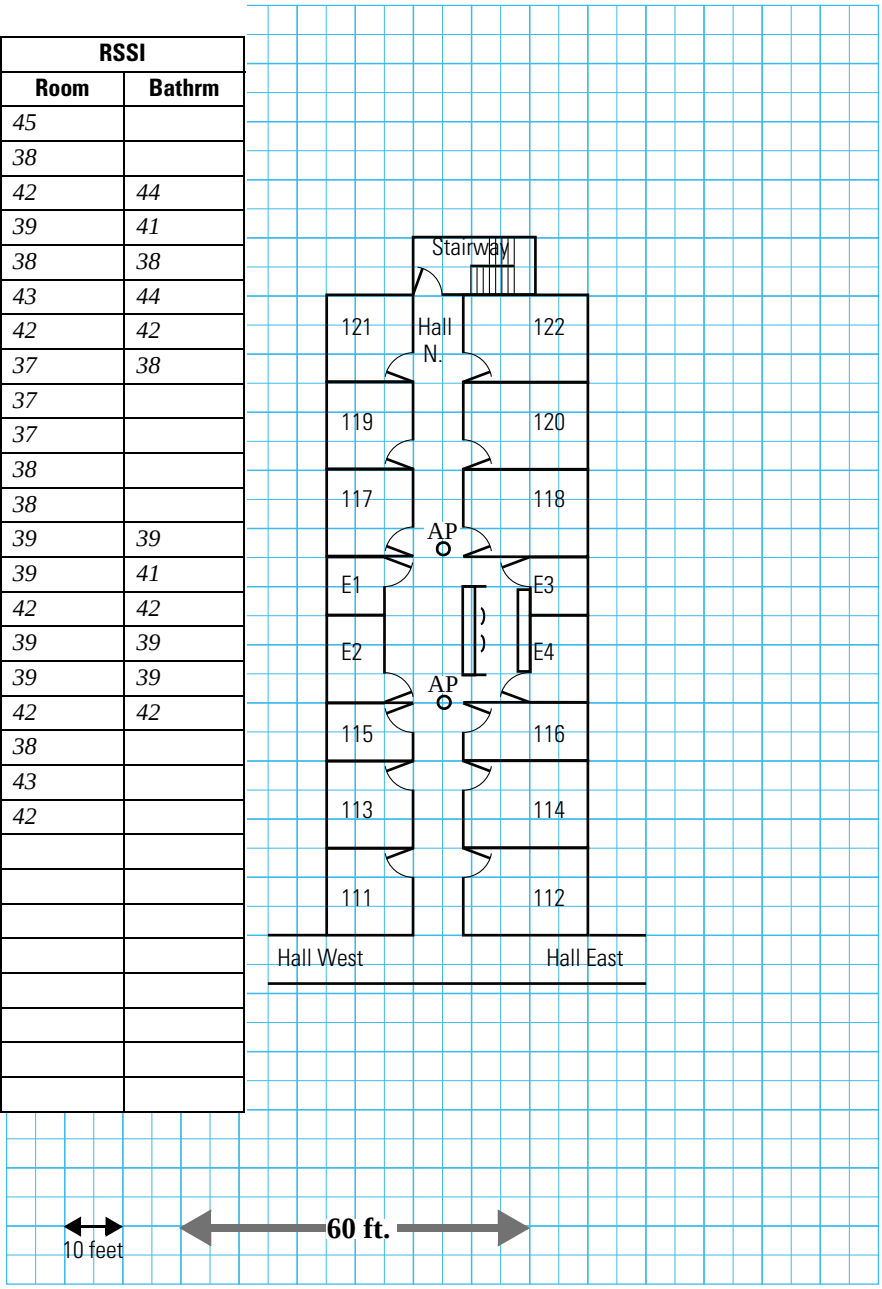
Room Number/ Location	RSSI	
	Room	Bathrm



Example of Completed RSSI Measurement Chart

Here is an example of a completed RSSI Measurement Chart ("Example 2 - Single-Corridor Floor Plan" on page 9).

Room Number/ Location	RSSI	
	Room	Bathrm
Stairway	*45*	
Hall N.	*38*	
121	*42*	*44*
119	*39*	*41*
117	*38*	*38*
122	*43*	*44*
120	*42*	*42*
118	*37*	*38*
E1	*37*	
E2	*37*	
E3	*38*	
E4	*38*	
115	*39*	*39*
113	*39*	*41*
111	*42*	*42*
116	*39*	*39*
114	*39*	*39*
112	*42*	*42*
Hall S.	*38*	
Hall West	*43*	
Hall East	*42*	



Perform Final Installation of APs

If the RSSI testing was satisfactory for your facility, have qualified personnel complete the final installation of the APs. The APs are typically mounted either on the wall, on the ceiling, or just above the ceiling (for suspended ceilings).

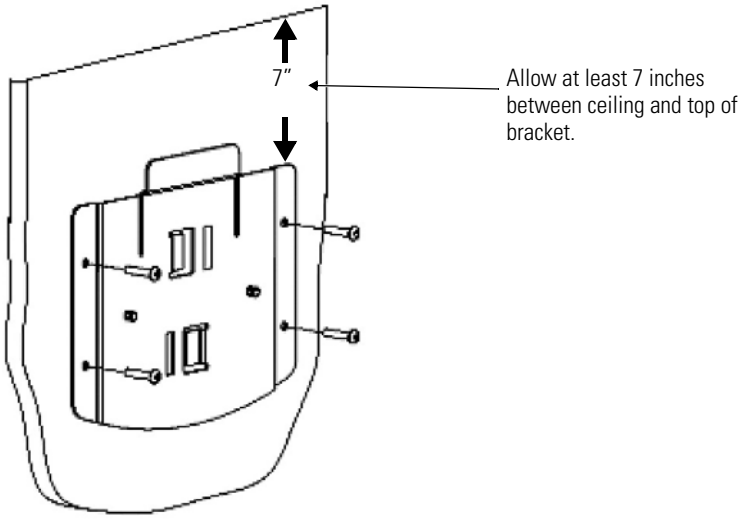
Note Locate APs and AP antennas at least 2 feet away from any space where people frequent. For example, installation on an 8-foot ceiling is acceptable, but on top of the desk at the Nurse's Station is not.

WARNING Do not install an Access Point or Access Point antenna closer than 2 feet from any location where people frequent. Installation closer than 2 feet could result in exposure to levels of radio frequency energy that are higher than recommended by the Federal Communications Commission (FCC).

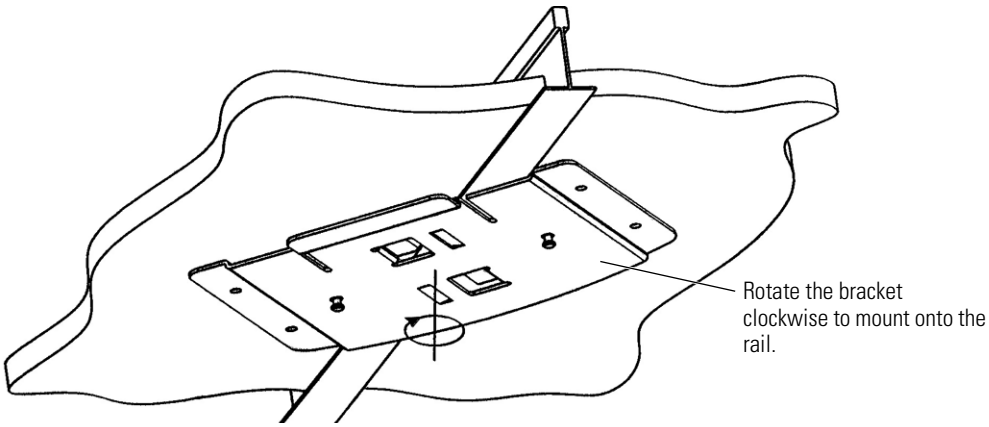
To install the AP and antennas:

1. Mount the AP bracket in the desired location.

   - For Wall Mounting, use screws to mount the bracket near the ceiling as shown. Be sure to allow at least 7 inches between the top of the bracket and the ceiling to allow room for the whip antenna to be oriented vertically on the AP.

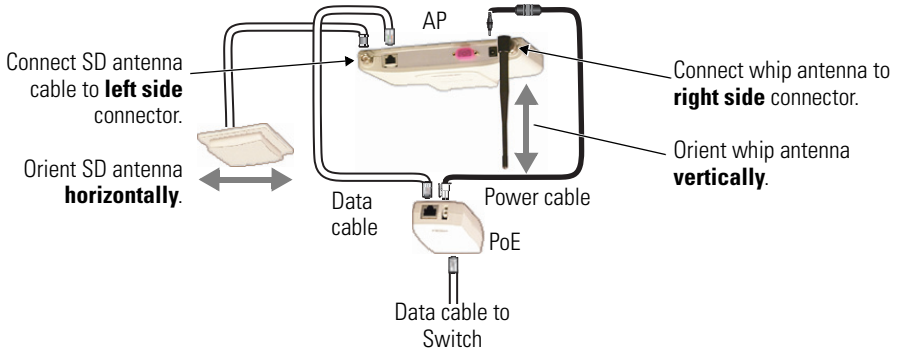


   - For ceiling mounting, use screws if there is an appropriate ceiling surface for mounting. For suspended ceilings, push ceiling tiles back to provide working space, then place the mounting plate diagonally so that the open ends of the clips are aligned on the rail as shown. Gently turn the bracket clockwise so the clips slide over the rail. Make sure both clips are securely in place.



- For mounting above suspended ceiling tiles, push back the tiles, locate a suitable place, and mount the AP.

2. Insert the AP into the mounting bracket with the keyhole slots aligned at the back, then slide the AP into place. Make sure the AP is securely attached.
3. Mount the SD antenna **horizontally** on the ceiling. For suspended ceilings, cut out a notch in the corner of a tile to allow the SD cable to recess into the ceiling. Then slide the SD antenna clips over the rails to hold the antenna in place.
4. Route the SD antenna cable to the AP and connect it to the **left side** connector.
5. Connect the whip antenna to the AP **right side** connector and orient the antenna so it is **vertical**.



6. Connect the data cable and power cable from the PoE to the AP.
7. Secure the PoE appropriately (use the clip on the back of the PoE to attach it to one of the cables), and make sure the data cable is connected to the Switch.

For best performance and network coverage:

- Make sure the SD antenna is horizontally positioned at the ceiling.
- Make sure the whip antenna is vertically positioned on the AP.
- Make sure the antennas are connected to as shown in the illustration above.

  The AP **left side** connector is for the **primary** antenna (the back of the AP is marked with a "I"). Since the SD antenna has higher performance than the whip antenna, connect it to the left side.

  The AP **right side** connector is for the **secondary** antenna (the back of the AP is marked with a "II"). Connect the whip antenna to the right side.

What to do if RSSI is Greater than 50

If you repositioned the APs and AP antennas but you still had areas in your facility where the RSSI is too high, your facility may have extra obstructions that will require additional APs for your Acuity LT Wireless System (up to a maximum total of 7 APs).

- For general information about locating APs and avoiding obstructions in your facility, see "Plan the Location of Your Access Points" on page 6.
- For assistance in purchasing additional APs, contact your Welch Allyn representative.
- For information about how to install additional APs, see "Installing Additional APs" on page 49.

5 Troubleshooting & Support

Troubleshooting

If your Acuity LT wireless system does not work properly, use this table as a guide to help identify and solve problems

Table 8. Acuity LT Wireless System Troubleshooting

Symptom	Possible Cause and Suggested Response
CHECK NETWORK message at Acuity	Acuity LT did not get the expected response from 1 or more APs. • Confirm all data cables are properly connected between CPU, Switch, APs • Confirm PoEs are properly connected and powering APs • At each AP, confirm green link light LED is on continuously (3rd from left on AP front panel) • Check green LEDs above data cable ports at Switch: --Data cable to CPU: Left link light LED should be on continuously. --Data cable to APs: Right link light LED should be on continuously. • If the LED is not on continuously, check for a faulty data cable or problem with CPU or APs. • Shutdown and restart entire system (see Acuity LT DFU).
No display at Acuity	• Check power to UPS, CPU, Display; make sure ALL power switches are on (CPU front panel, Display front and rear panel). • Check video cable between CPU and Display. • Shutdown and restart entire system (see Acuity LT DFU).
No sound from Display speakers	• Check connections of external audio cable between CPU and Display: At CPU, connect to headphone jack. At Display, connect to Input 1 Audio jack. • Make sure the speaker volume control on the Display is turned up.
Wireless monitors dropout in particular locations in facility	AP may not be working • At each AP, confirm green link light LED is on continuously (3rd from left on AP front panel). If not, check all data cable and power connections for that PoE and AP. Network coverage in that location may be blocked by particular obstructions or beyond range of nearest AP. • Perform the RSSI check for that location in your facility (see "Measure RSSI for Your Facility" on page 30). If RSSI is over 50, consider adding more APs (up to a maximum total of 7 APs). Wireless monitor(s) may not be configured with the Network Name for that Acuity LT system. • Look at the CPU left side panel (near front) and find the label indicating the Network Name for the Acuity LT system (similar to "com8.protocol"). • Check the monitor Network Name and change it if necessary (see "Monitor Network Name (ESSID)" on page 43). Retest network coverage with the monitor(s).

Technical Support

For technical assistance, contact Welch Allyn Technical Support. See page ii for contact information.

A Specifications

Table 9. Acuity LT Wireless System Network Specifications

Characteristic	Specification
Network Type	2.4 GHz Wireless Local Area Network (WLAN) and 10/100 Base-T Ethernet network
Radio Frequency	Refer to Wireless Monitor *Directions For Use*
Modulation	Frequency Hopping Spread Spectrum (FHSS)
IEEE 802.11 compliant	Yes
Wireless patient monitors	Any combination of Welch Allyn Propaq CS, Propaq LTR, or Micropaq patient monitors[a]
• 12-Patient System • 28-Patient System	12 maximum monitors at one time 28 maximum monitors at one time
Access Points	
• 12-Patient System • 28-Patient System	Standard installation includes 2 Access Points. Standard installation includes 4 Access Points. Additional Access Points are available for purchase for both the 12 and 28-patient systems if required to provide adequate network coverage (up to maximum total of 7 Access Points) For optimum wireless network communication: • Install Access Points between 6 and 40 feet apart (for systems with more than 2 Access Points, each Access Point must be within 40 feet of another Access Point).
Range	60 feet maximum distance between monitor and Access Point for effective wireless communication assuming standard obstructions. • Actual range of communication for each facility can only be determined after system installation as described in the Final System Check ("Step 4 - Check Final System Operation" on page 26). • All obstructions reduce effective communication. Refer to "Plan the Location of Your Access Points" on page 6 for a description of obstructions.

a. Assuming network loading is shared by multiple Access Points.

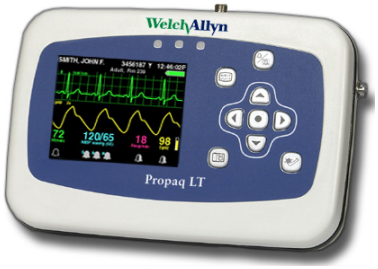
The following table lists all of the Acuity LT Wireless System components. All components have been validated and approved for use within the Acuity LT Wireless System. Except for the Printer and UPS, all other replacement devices must be ordered from Welch Allyn to make sure they meet system performance requirements and are properly configured as required.

Table 10. Acuity LT Wireless System Equipment Descriptions and Specifications

Equipment		Typical Dimensions and Power Requirements[a]
Display • 19 inch viewable display • Data cable connects to CPU • Second Display (and data cable) for 28-patient system • Audio cable connects to CPU to enable Display speakers		Width: 17.7 in. (45.0 cm) Height: 16.7 in. (42.4 cm) Depth: 9.5 in. (24.2 cm) Weight: 18.1 lb. (8.3 kg) Power: 100 to 120/220 to 240 VAC auto sense
Central Processing Unit (CPU; Sun Microsystems SunBlade 150) • Supports required Access Points and 12-28 wireless patient monitors • Includes keyboard, mouse, and country-specific keyboard (trackball with 28-patient system)		Width: 18.0 in. (45.7 cm) Height: 4.6 in. (11.8 cm) Depth: 17.6 in. (44.6 cm) Weight: 26.9 lb. (12.2 kg) Power: 100 to 120/220 to 240 VAC
8 Port Switch (Milan) • Supports up to 7 Access Points		Width: 6.3 in. (16 cm) Height: 1 in. (2.8 cm) Depth: 4 in. (10 cm) Weight: 1 lb. (0.45 kg) Power: 100-240 VAC
Access Points (APs) (Symbol Technologies AP-3020/AP-3021) • Each AP is uniquely preconfigured and labeled. **APs are factory-configured by Welch Allyn and are not interchangeable.** • Two antennas for each (SD and whip type)		Width: 7.8 in. (19.7 cm) Height: 1.3 in. (3.2 cm) Depth: 5.5 in. (15.0 cm) Weight: 1.0 lb. (0.46 kg) Power: DC supplied by Power-Over-Ethernet devices.
4 Power-Over-Ethernet (PoE) devices • 2 PoEs for each Access Point		Power: DC (AC/DC adapter plugs into UPS)
Parallel printer (model may vary)		See printer manual for specifications
2 Uninterruptible Power Supplies (UPS) Model may vary outside the U.S. Third UPS required for 4-7 APs. • Each provides temporary power for up to 4 devices • Typical run time 5 min. at max. load • 28-patient system requires larger capacity UPS (minimum 750 VA) for the Nurse's Station location to support the displays		Power: 100 to 120/220 to 240 VAC
Modem (US Robotics) Model may vary outside the U.S. • Connects to CPU to enable access by remote technical support.		Power: DC (AC/DC adapter plugs into UPS)

a. Contact Welch Allyn for current part numbers and model numbers.

Table 11. Wireless Monitors for Acuity LT Wireless System

Monitor	Description
 Micropaq wearable patient monitor	• 5 lead ECG and optional motion-tolerant SpO2 • Heart rate, SpO2 numerics, pulse bar • Communicates data through APs to Acuity system • Operates stand-alone with continuous monitoring and alarms when outside range of APs • Auto-reconnects when returned within range of APs • Adult and pediatric mode Size: 7.3 in. x 3.5 x 1.5 (18.5 cm x 8.9 x 3.7) Weight: 17.3 oz. (0.5 kg) with SpO2 Power: Rechargeable lithium ion battery
 Propaq LTR portable patient monitor	• Heart rate/pulse rate • 5 or 3 lead ECG and SpO2 • Motion-tolerant noninvasive blood pressure • Impedance respiration • Charging cradle with optional communication and PC printer connection • Communicates data through APs to Acuity system • Operates stand-alone with continuous monitoring and alarms when outside range of APs • Auto-reconnects when returned within range of APs • Adult, pediatric, and neonatal mode With all options: Size: 7.4 x 5.2 x 2.1 in (18.8 x 13.2 x 5.3 cm) Weight: 2 lbs (0.9 kg) Power: Rechargeable lithium ion internal battery
 Propaq CS Wireless portable patient monitor	• Heart rate/pulse rate • 5 or 3 lead ECG and motion-tolerant SpO2 • Motion-tolerant noninvasive blood pressure • Temperature (2 channels) • Invasive blood pressure (up to 2 channels) • Capnography (mainstream and/or sidestream) • Impedance respiration/apnea • Thermal strip printer • Communicates data through APs to Acuity system • Operates stand-alone with continuous monitoring and alarms when outside range of APs • Auto-reconnects when returned within range of APs • Adult, pediatric, and neonatal mode With all options: Size: 11.4 x 9.6 x 7.7 in (28.8 x 24.4 x 19.7 cm) Weight: 14.4 lbs (6.5 kg) Power: Rechargeable sealed lead acid internal battery

B Monitor Network Name (ESSID)

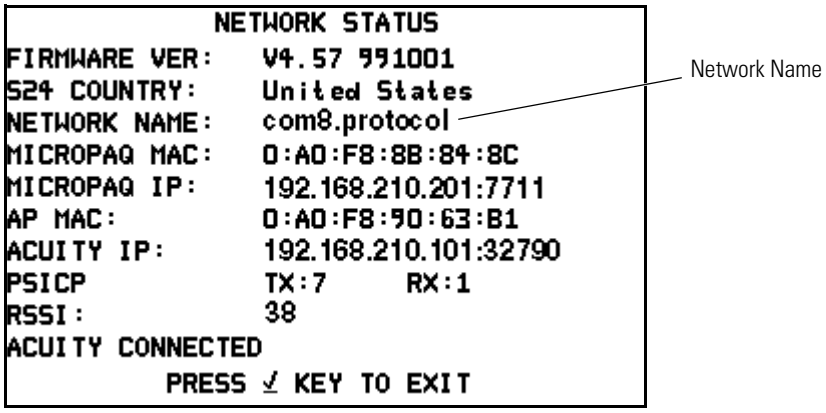
In order for a wireless monitor to connect to the Acuity LT Wireless System network, the monitor must be set to the correct Network Name (ESSID) for the system. The system Network Name is shown on a label on the left side panel of the CPU.

This section describes how to check and change the Network Name for each of the wireless monitors that can be connected to the network.

Micropaq Network Name (ESSID)

Check the Micropaq Network Name

1. Press **Scroll Down** as needed to highlight **SYSTEM INFORMATION**, and press **Select** to display the System Information Menu.
2. Press **Scroll Down** twice to highlight **NETWORK STATUS**, and press **Select**.



3. Press **Select** to exit.

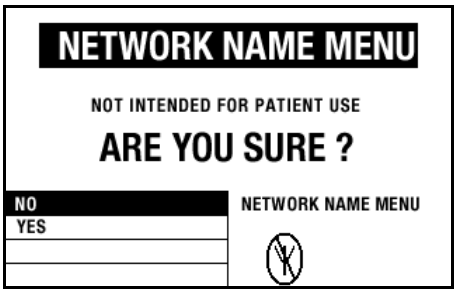
Change the Micropaq Network Name

This procedure allows you to change the Micropaq Network Name.

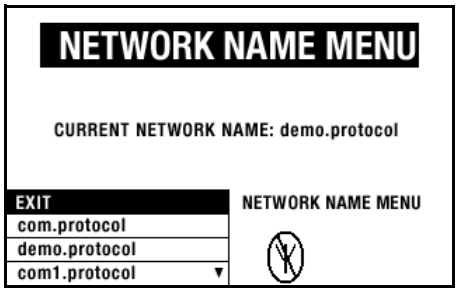
Note Changing the Micropaq network name will cause the Micropaq monitor to re-start and seek to connect with any nearby Acuity wireless network corresponding to the new name. Do not attempt to change the network name unless you are a qualified biomedical service engineer or technician.

1. Press **Scroll Down** repeatedly until **SERVICE MENU** is highlighted.
2. Press **Select** to display the Service Menu screen.
3. Press and hold down **Scroll Down** and **Scroll Up**, then press **Select** to display the **Network Name Menu**.

   The Micropaq will display the following screen:



4. Press **Scroll Down** to highlight **YES**, and press **Select** to display the following screen:



The Micropaq displays one of the following pre-set names:

com.protocol
demo.protocol
com1.protocol
com2.protocol
. . . . . .
com7.protocol
com8.protocol

- To change the Network Name, press **Scroll Up** or **Scroll Down** to highlight the desired Network Name, and press **Select**. The Micropaq automatically turns itself off, and then turns on and seeks to connect to the Acuity LT network with the new Network Name.
- To exit without changing the Network Name, make sure **EXIT** is highlighted and press **Select**.
- If you are not able to change the Network Name, contact Welch Allyn Technical Support for assistance.

WARNING When setting the Network Name, make sure that the monitor Network Name matches the CPU for your Acuity LT wireless system. If a different Network Name is set, the monitor could connect to a different nearby Acuity wireless system which has that Network Name resulting in confusion about patient monitoring and the location of patient data.

Propaq LTR Network Name (ESSID)

Check the Propaq LTR Network Name

1. From the main display, highlight **SpO2** and press ⦿.
2. Highlight **Setup** and press ⦿ to access the **Setup** menu.
3. Highlight **Service** and press ⦿ to access the **Service** menu.
4. Highlight **Radio**, then highlight **Show Info** and press ⦿.

   The monitor displays the current Net name. The Net name must match the Network Name on the CPU left side panel label to connect to the Acuity LT Wireless system.
5. To exit, highlight **Exit** and press ⦿.

Change the Propaq LTR Network Name

This procedure allows you to change the Net Name.

Note Changing the Propaq LTR network name will cause the Propaq LTR monitor to seek to connect with any nearby Acuity wireless network corresponding to the new name. Do not attempt to change the network name unless you are a qualified biomedical service engineer or technician.

1. From the main display, highlight **SpO2** and press ⦿.
2. Highlight **Setup** and press ⦿ to access the **Setup** menu.
3. Highlight **Service** and press ⦿ to access the **Service** menu.
4. Highlight **Radio**, then highlight **Net Name** and press ⦿.

   The monitor displays the list of possible Net Names (scroll to see the entire list):

   com.protocol
   demo.protocol
   com1.protocol
   com2.protocol
   . . . . .
   com18.protocol

   The current Net Name is highlighted.
5. To change the Net Name, scroll to highlight the desired Net Name, then simultaneously press ◀ and ▶ (the left and right arrow buttons). The monitor is now set to the new Net Name.
6. Press ⦿ to exit the **Net Name** menu.

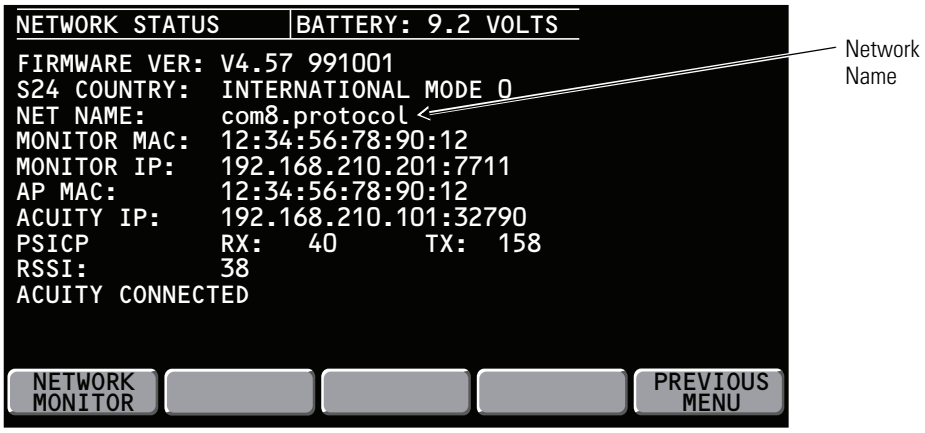
   To recheck the Net Name, highlight **Show Info** and press ⦿.

WARNING When setting the Network Name, make sure that the monitor Network Name matches the CPU for your Acuity LT wireless system. If a different Network Name is set, the monitor could connect to a different nearby Acuity wireless system which has that Network Name resulting in confusion about patient monitoring and the location of patient data.

Wireless Propaq CS Network Name (ESSID)

Check the Wireless Propaq CS Network Name

1. From the Main Menu press **SETUP, MORE, MORE, SERVICE, YES, MORE, MORE, RADIO STATUS**.



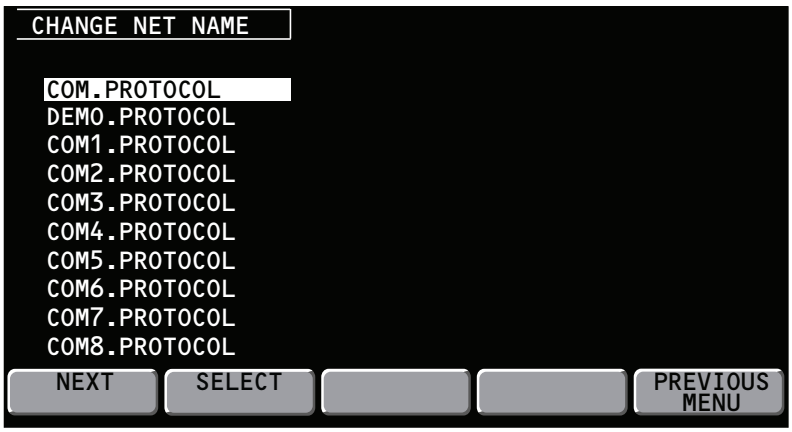
Change the Wireless Propaq CS Network Name

This procedure allows you to change the Wireless Propaq CS Network Name.

Changing the network name will cause the monitor to re-start and seek to connect with any nearby Acuity wireless system corresponding to the new name. Do not attempt to change the network name unless you are a qualified biomedical service engineer or technician.

1. From the Main Menu press **SETUP, MORE, MORE, SERVICE, YES, MORE, MORE, RADIO STATUS, CHANGE NET NAME** to access the Change Net Name screen.

   The current network name is highlighted. (To exit without changing the network name, press **PREVIOUS MENU** or **Home**.)



2. To change the network name, press **NEXT** as needed to scroll down and highlight the desired network name, then press **SELECT**.

The monitor displays a confirmation screen asking you to confirm that you want to change the network name.

- If you press **YES**, the monitor automatically turns itself off, then turns on and seeks to connect to the Acuity LT system with the new network name.
- If you press **NO**, the monitor displays the Change Net Name screen again.

WARNING When setting the Network Name, make sure that the monitor Network Name matches the CPU for your Acuity LT wireless system. If a different Network Name is set, the monitor could connect to a different nearby Acuity wireless system which has that Network Name resulting in confusion about patient monitoring and the location of patient data.

WARNING When using a Propaq CS monitor which has both hardwired and wireless Acuity capability, be aware that when the monitor is unplugged from an Acuity hardwired system, it will automatically attempt to make a wireless connection with any nearby Acuity wireless system. To prevent the monitor from making this wireless connection, make sure that the monitor Network Name does not match the Network Name of any nearby Acuity wireless system.

C Installing Additional APs

If the Final System Check (described on "Step 4 - Check Final System Operation" on page 26) indicates that there are areas of your facility where the network coverage is not adequate (RSSI is 50 or above), you may want to consider installing additional Access Points (APs). You can install up to a maximum total of seven APs.

Inadequate network coverage can typically occur in an area where there are too many obstructions such as the following:

- Behind elevators
- Behind metal-reinforced walls
- Too many walls between the monitor and AP

To Order Additional APs

Contact your Welch Allyn representative. (In the United States call 1-800-289-2501.)

Note If your system will have four to seven APs, you will also need to add an additional UPS to accommodate the additional PoE Power Supplies.

To Install Additional APs

After you receive the additional APs, perform these steps to install:

1. Identify the location (or locations) where you want to place the additional AP (or APs). Refer to "Plan the Location of Your Access Points" on page 6 and review the information about obstructions and AP placement.
   - Remember that each AP must be located within at least 40 feet of another AP to allow adequate overlap between AP locations, and adequate network coverage as wireless patient monitors are being moved throughout the facility.
   - If your facility has additional obstructions (such as wire-mesh or metal reinforced walls), you may need to locate the APs closer together than 40 feet.
   - Before installing permanent wiring for the APs, it might be worthwhile to run temporary data cables from the Switch to the new AP locations and test the network coverage.
2. Install wiring for the APs using guidelines in "Install Wiring for all Equipment" on page 13.
3. Temporarily install the APs as described on "Step 3 - Set Up and Connect the Equipment" on page 23. Make sure all supporting equipment is properly connected and powered (PoEs, PoE power supplies, data cables, power cables, and antennas).

You need an additional UPS for the PoE power supplies if your system has four or more APs.

4. Confirm that within 2-3 minutes of receiving power the green Link LED (3rd LED from left on the front of the AP) is continuously on.
5. Measure RSSI throughout your facility to check the network coverage. (See "Measure RSSI for Your Facility" on page 30.)
6. If RSSI testing is satisfactory, perform the final installation of the new APs. (See "Perform Final Installation of APs" on page 34.)

   If RSSI testing is not satisfactory, refer to "Troubleshooting" on page 37.